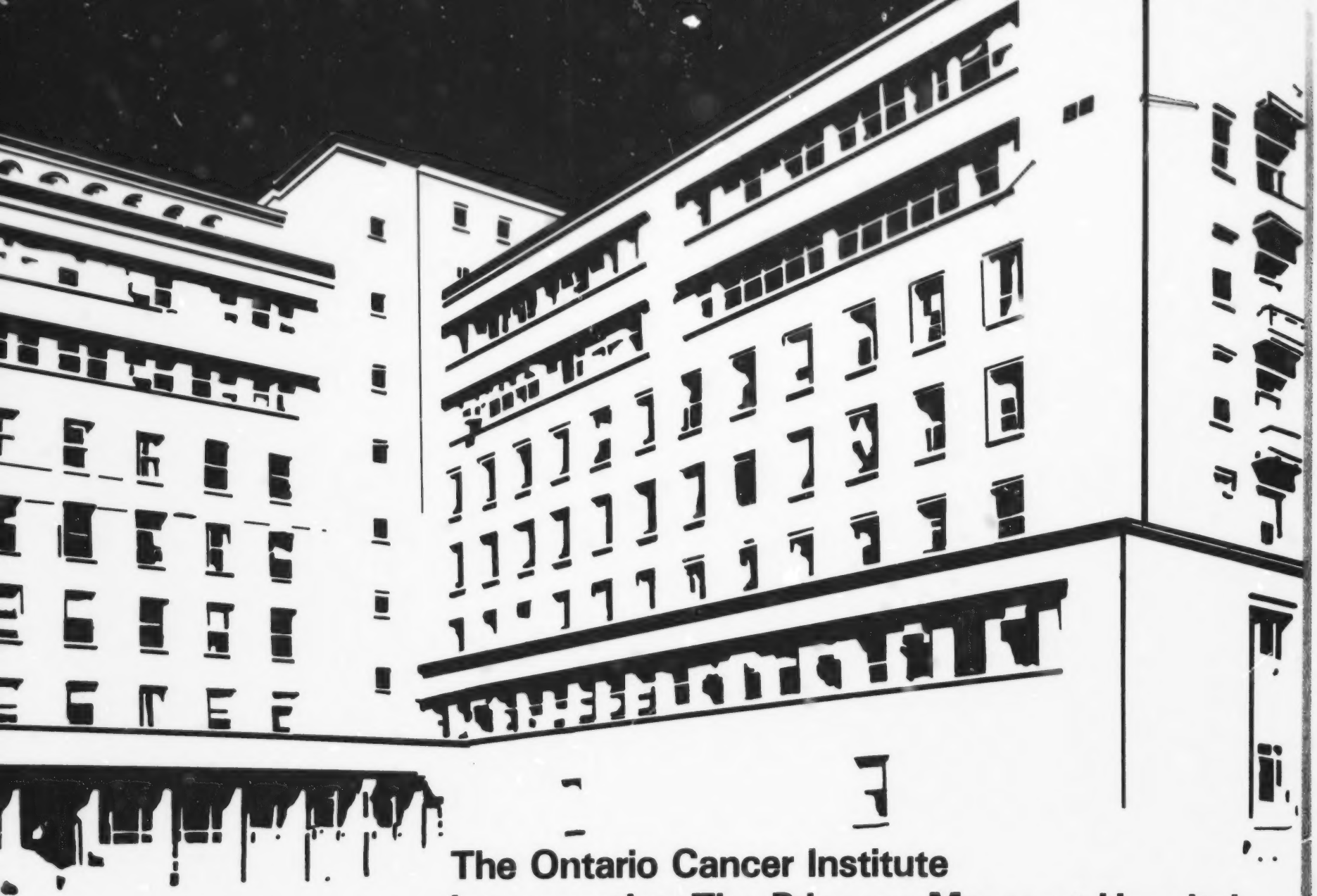

The Ontario Cancer Institute
incorporating The Princess Margaret Hospital
Annual Report 1982 - 83

OCI

The Ontario Cancer Institute

500 Sherbourne Street
Toronto / Canada M4X 1K9
(416) 924-0671

August 31, 1983

The Honourable Keith Norton, Q.C.
Minister of Health,
10th floor, Hepburn Block,
80 Grosvenor Street,
Toronto, Ontario M7A 2C4

Dear Sir:

It is again my pleasure to submit the Annual Report of The Ontario Cancer Institute incorporating The Princess Margaret Hospital for the year ended 31 March, 1983.

It was a year of both progress and adjustment at the Institute and this Report outlines many of the highlights. The clinical and research programs continue to illustrate the level of excellence that has come to symbolize the Institute. At the same time, patient service at The Princess Margaret Hospital continues at a level which seriously strains the Institute's physical resources. It was disappointing, therefore, to learn that the planned expansion, recommended in the 1973 role study and approved in principle by your Ministry in 1981, could not be funded in the 1980s. The Board and the staff have embarked on a review of the Institute's long-range plans and look forward to the continuing support of the Ministry of Health in implementing these plans.

It is with great satisfaction that I direct your attention to the accomplishments of the staff and the awards and honours they have received. I would also like to take this opportunity to express the appreciation of the members of the Board of the Institute for the loyalty and devotion of all persons connected with the Institute.

Yours sincerely,

R.W. Stevens
Chairman of the Board

THE
PRINCESS MARGARET
HOSPITAL

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1982-83

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Assistant Administrators:
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Auxiliary of The Princess Margaret Hospital and Lodge

President:
Mrs. N. MacLeod Rogers**
Mrs. K. G. McVittie*

The Nuclear Magnetic Resonance Imager (NMRI) was officially opened by former Minister of Health The Honourable Larry Grossman, shown to the right. This scanner is one of the first installed in Canada, and is being used for two yesrs in an experimental program to assess the diagnostic accuracy of nuclear magnetic resonance imaging in oncology.

INTRODUCTION

The year covered by this Annual Report was one of innovation as well as adjustment at The Ontario Cancer Institute (OCI).

Early in 1982, the Board and the staff of the Institute were pleased to learn that the Province of Ontario would provide funds for the purchase of nuclear magnetic resonance imaging equipment to be located at the OCI.

This totally new form of diagnostic imaging is able to take pictures within the human body without the use of radiation and is likely to be very effective in the identification of human tumours. A team of doctors and scientists from the University of Toronto and several of its teaching hospitals was assembled to work with the research and clinical staff at the OCI to discover the best way to use this new imaging technique and to demonstrate its usefulness in the assessment of patients with cancer. In an informal ceremony on 1 March, 1983, The Honourable Larry Grossman, Minister of Health, visited the OCI to open the nuclear magnetic resonance imaging unit.

During the past year, the Institute was informed by the Ministry of Health that the expansion recommended in the 1973 role study and approved in principle in 1981, could not be funded in the immediate future. In response, the Board and the staff embarked on a multi-stage review of its long-range plans for the future. While these plans will culminate in a new role study scheduled for 1983 - 84, the 1982 - 83 period had to be devoted to interim plans for the short term. These plans largely reflect the need to replace and upgrade radiotherapy equipment within the existing building and to provide relief for over-crowded service and support departments.

The Ontario Cancer Institute's radiotherapy equipment is composed of a full range of energies; however, half of the treatment units are well over twenty years old and need replacement. During the past year, the technical and mechanical status of existing radiotherapy equipment was reviewed and radiation oncologists were surveyed to determine the therapy machine mix required for optimal radiotherapy. From these two studies, existing equipment was evaluated for its adequacy to provide good radiotherapy and plans were developed for equipment replacement.

The survey revealed radiation oncologists' preference for medium and high energy x-rays over low energy cobalt-60. While this is consistent with the plans developed for expanded facilities in the future, any selection of equipment at this time is limited by the space and shielding constraints imposed by the existing building.

It was determined that a maximum of two new linear accelerators could be accommodated in the existing space and that sequential installation should be planned to minimize disruption of patient service. A 6 MeV unit was purchased and installed during the past year, and a 25 MeV unit will be installed in 1983 - 84. While these improvements in the Institute's radiotherapy equipment help to maintain facilities which are state-of-the-art, it is a serious concern to the Board and the staff that further improvements in the future cannot be accommodated in existing facilities.

To provide relief for over-crowded service and support departments, a number of internal moves were implemented during the past year. While such moves yielded more space for busy operational areas, the improvements were made at the price of efficiency in staffing. The Medical Records and Outpatient Departments are each now spread over three sites, two located on different floors of the Hospital and one in a peripheral building a block away on Jarvis Street. Both departments have improved the efficiency of their staff utilization through the introduction of computerized systems; however, this efficiency has been more than offset by the staffing additions required because of decentralization.

The Ontario Cancer Institute's role as an institution totally devoted to life support programs, and the indefinite delay in implementing the planned expansion have limited the Institute's ability to operate under the guidelines of the Business Oriented New Development (BOND) plan introduced by the Ministry of Health a year ago. Nevertheless, OCI's operating plans and practices do reflect one of the basic components of the BOND program, viz. an increase in shared services with other hospitals.

While there has always been an active program of shared services with the adjacent Wellesley Hospital, in the spring of 1983 The Princess Margaret Hospital acquired a second partner in shared services, when the Orthopaedic and Arthritic Hospital accepted its proposal to share materials management services. The department head is spending half-time at each hospital while she develops each phase of the plan to rationalize services at the two hospitals.

In evaluating the new shared service, two criteria will be used: the cost effectiveness of the shared service, and the provision of a standard of service that is equal or superior to what was in place prior to rationalization. In that way, the Institute hopes to ensure that not only the two hospitals concerned, but the health care system in general will benefit.

As the year drew to a close on 31 March, 1983, The Ontario Cancer Institute was approaching the twenty-fifth anniversary of its official opening and the admission of the first patient to The Princess Margaret Hospital in 1958. Its celebration of a quarter century of care and research will be reported in next year's Annual Report.

RESEARCH REPORT

Molecular Biology

The major concepts of the flow of biological information, first enunciated almost thirty years ago, remain valid today. Information is stored in deoxyribonucleic acid (DNA), and replicated when cells divide. The message is transcribed into ribonucleic acid (RNA) and then translated into functional protein.

Recently, however, major new molecular technologies have been developed; from their application to the study of DNA and RNA new concepts have emerged. For example, it is now known that some segments of DNA do not contain information necessary to specify protein structure. These "introns" must be excised during transcription. Further, it is now appreciated that DNA itself is not entirely stable; pieces of DNA, called transposable elements, may move from place to place in the genome.

In the last year, OCI scientists discovered such transposable elements inserted in DNA coding for immunoglobin molecules in mouse hybridoma cells. Further, they were able to show that these transposable elements can be identified as discrete structures by electron microscopy. The role of transposable elements in the regulation of immunoglobulin synthesis continued to be an active field of research.

DNA structure is known to play an important role in cancer. During the last year the complete structure of the DNA from a leukemogenic virus (SFFV) was determined at the Institute. Knowledge of the sequence of bases (the chemical components of DNA) in this virus is helpful in understanding the nature of the proteins that endow normal cells with malignant properties; further, certain segments of the DNA are important in the regulation of its transcription into RNA and the post-transcriptional modification of the message.

Scientists are no longer restricted to studying DNA as it exists in living organisms. The molecules can be transferred from cell to cell and their behaviour in their new environment determined. Institute scientists have much experience with certain viruses. This knowledge has made it possible for them to use viral structures as carriers in DNA transfer experiments. In initial studies this procedure has been used to insert new genetic information into blood-forming cells. These experiments make it reasonable to consider that technology may be developed that will permit correction of cellular genetic defects.

Hemopoiesis and Leukemia

Molecular biology now cuts across many areas of cancer research, but the traditional strengths in the Institute have been maintained and reinforced. Among these is the study of blood formation (hemopoiesis) and the malignancies derived from hemopoietic cells (leukemias). Blood formation originates in stem cells capable of reproducing more of their own kind as well as families of specialized descendants. Emphasis has been placed upon the study of stem cells outside the body in culture.

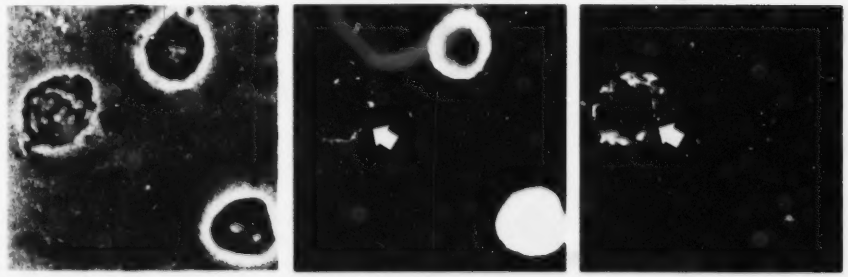
A procedure has been developed at the Institute that permits single human stem cells to give rise, in culture, to colonies that contain all of the functional families known to be produced by such cells *in vivo*. Further, these cells may be maintained in long term culture. By using this methodology it has proved feasible to identify stem cell subclasses differing in the kinds of functional cells that derive from them. A particular achievement of the last year has been the finding that some, but not all, stem cells have the ability to give rise to lymphocytes.

Lymphocytes are hemopoietic cells that are responsible for immune function. Their study continues to be emphasized. A major aim is to try to understand how the immune mechanism is generated and recognizes substances or cells as foreign. The role of the thymus in this process is being studied actively.

Another important advance has been in the identification of a new cell type ("veto" cell) which has the capacity to delete certain lymphocytic precursors that are capable of recognizing normal cells. These veto cells may be important in the maintenance of the capacity of the system to identify normal cells while rejecting those that are foreign.

The study of clinical leukemia continues. New immunological reagents are now available that permit the characterization of the blast cells from patients with this disease. This technology has permitted a novel observation: that is, individual leukemic blast cells may express simultaneously proteins that are not normally found together.

Because of the close collaboration between scientists and clinicians, it has been possible to show that the presence of these doubly-marked cells is predictive of a poor response to treatment with the chemotherapeutic regimens now being used. Such information is essential for the evaluation of clinical trials and may lead to the development of individualized treatment regimens.



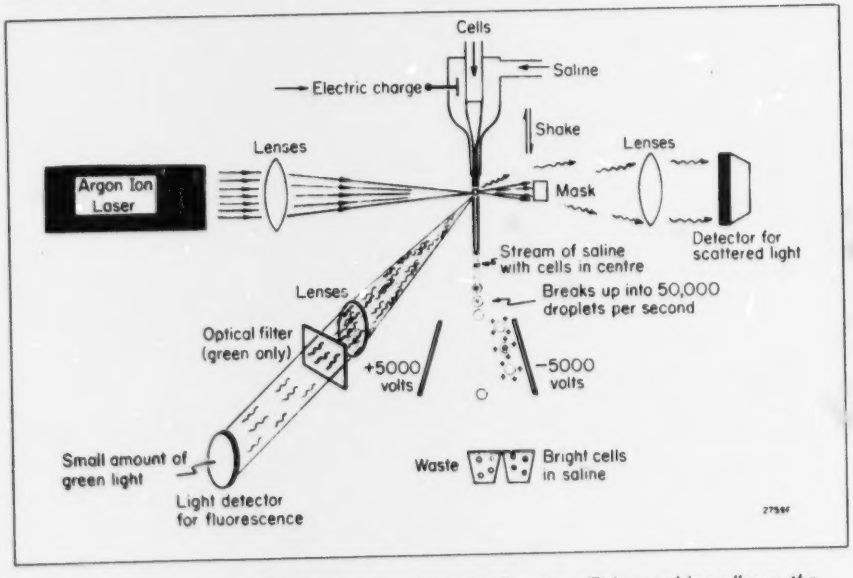
Leukemic blast cells photographed to demonstrate two markers on a single cell, indicated by an arrow. The left-hand panel shows the appearance of unstained cells. From this photograph, blasts are identified. The middle panel shows the presence of immunoglobulin in the cytoplasm. This is characteristic of cells maturing to become B-lymphocytes. The right-hand panel shows the presence of a marker for granulocytes (My-1). Thus, a single blast cell is attempting to express, at the same time, both lymphoid and myeloid characteristics. Patients with such cells have a poor prognosis.

Solid Tumours

Solid tumours, the most common form of human cancers, continue to be an active subject of study. An hypothesis has been developed that the cells of such tumours are organized in a fashion similar to those in the blood-forming system. That is, it is suggested that a small fraction of cells in solid tumours are stem cells while the majority are capable of only a limited number of divisions. This model is under active test and methods are being developed for recognizing tumour stem cells specifically.

This model leads to the view that tumour stem cells are the appropriate targets for treatments designed to cure cancer. If stem cells can be eliminated, the rest of the cells will eventually use up their limited capacity for growth and the tumour will disappear. It is possible, in this context, therefore, to investigate reasons for both success and failure of treatment.

In this Institute, a specific cell surface protein has been isolated that appears to be an important determinant of the response of tumour cells to the killing effects of anti-cancer drugs. Progress is being made in the development of simple and accurate methods for measuring this protein quantitatively. These will then be applied to the study of cells from human tumours.



Schematic diagram of a fluorescence-activated cell sorter. This machine allows the biologist to separate a cell type of interest from all other cells providing he can make the cell of interest fluorescent. This is often easy to do.

A second cause of treatment failure is the spread of cancer beyond its site of origin (metastasis). The properties of the tumour stem cells responsible for metastasis are under active investigation using a model system in chicken embryos.

Breast Cancer Detection

The accurate detection and diagnosis of small abnormalities in the breast is important for reducing cancer mortality. Currently, OCI scientists are investigating both improved x-ray and ultrasound systems for this purpose.

The first approach is to develop digital x-ray imaging systems which will allow the detection of breast cancer at a smaller size. The x-ray

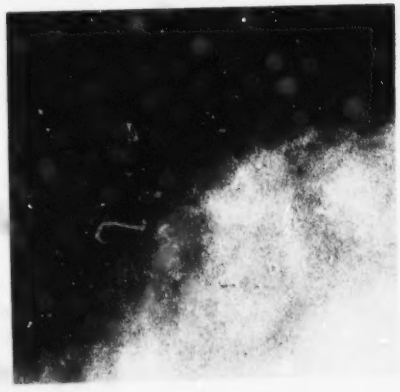


Figure 1

detectors being developed will allow a more efficient utilization of the x-rays transmitted through the breast, thus reducing the radiation dose to the breast from mammography. Also, by acquiring the image in digital form, powerful image processing techniques such as contrast amplification and edge enhancement can be used.

An example of the power of image processing is given by the two

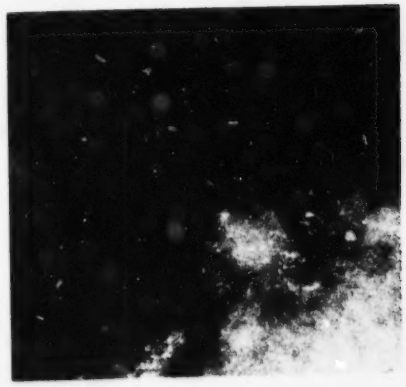


Figure 2

mammograms shown (Figures 1 and 2). Figure 1 is a digitized film mammogram showing a large tumour. In Figure 2, the same image has been edge enhanced and the contrast has been increased to reveal more detail in the calcifications and fibres radiating from the tumour.

There are two promising methods to produce digital radiographic images. The first is the commonly used area-beam technique coupled with an image intensifier-video chain for digital subtraction angiography. While this approach has certain advantages, it has two potential problems which limit its usefulness.

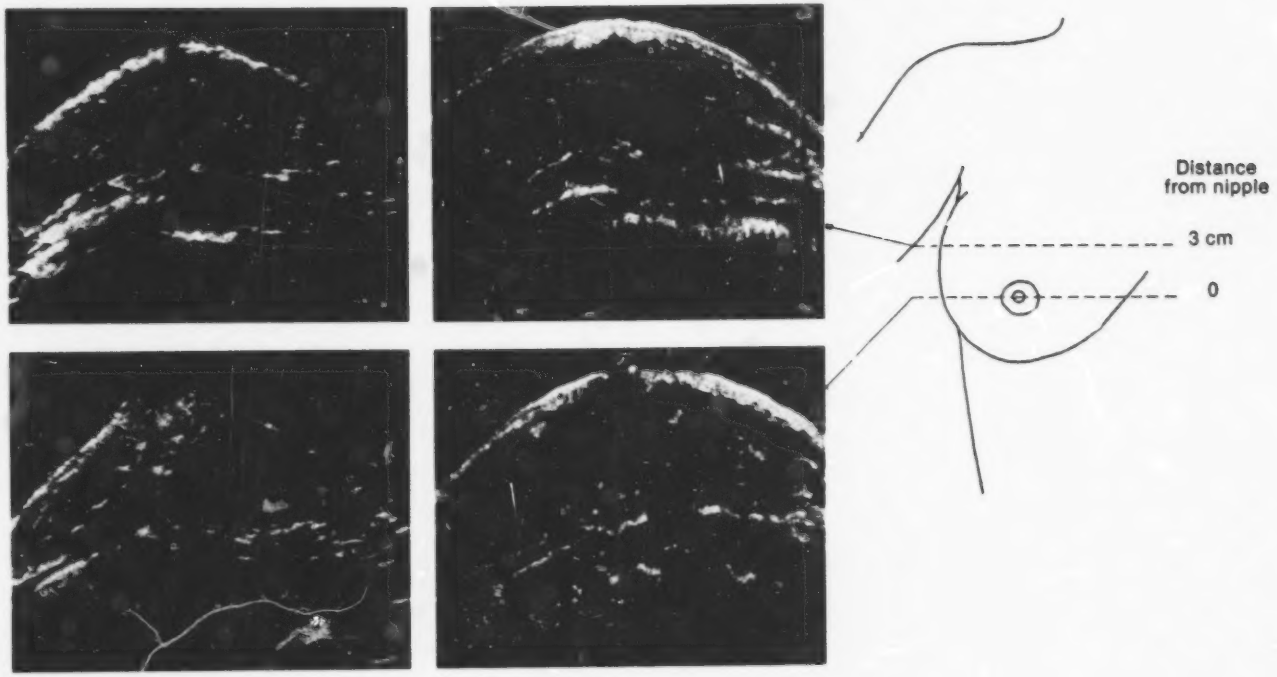
First, the television camera and associated electronics have a limited dynamic range because the video signals are noisy; and second, because of the broad beam of radiation, significant amounts of non-useful scattered radiation reach the detector. The scatter cannot be easily removed without increasing radiation dose. Both of these factors are important in non-subtraction imaging such as mammography and limit the ability of the radiologist to perceive small tumours.

The Institute has been investigating a second approach, called scanned projection radiography (SPR), in which the x-ray beam is collimated into a fan of radiation. The transmitted beam is then detected by a linear array of detectors, digitized and stored in a computer memory. To produce a complete image, either the patient is moved past the fan beam or the fan beam and detectors are moved past the patient. This method of digital radiography allows very little scattered radiation to reach the detectors.

For the past two years, OCI scientists have been developing a new high pressure xenon detector for digital SPR. A prototype detector with 96 elements (0.5 mm elemental width) has been constructed and preliminary results have shown that contrast changes due to small tumours can be clearly seen in the images produced by this technique.

An alternative technique for breast cancer detection is the use of ultrasound which has great potential as a diagnostic tool because it can detect lesions as small as 0.5 mm, yet is so safe that regular examinations can be encouraged. One serious limitation of traditional ultrasound breast scanners, however, is their poor resolution, resulting in streaky, speckled images.

Several new ultrasound breast scanners have been developed at the OCI. The most successful design is a hybrid system, which couples an annular array transducer with a novel conical transducer. Using this system, structures never observed by commercial ultrasound scanners have been visualized as shown by the enclosed figure. Two prototype breast ultrasound systems are being completed and will be tested at OCI and in the Radiology and Breast Centre Departments of Women's College Hospital, Toronto, Ontario, Canada.



Images at various levels in the breast of a 27 year old woman. Images on the left were obtained with a commercial breast scanner while those on the right were obtained with the cone/array hybrid. Note the greatly improved visualization of the morphology of the young normal breast.

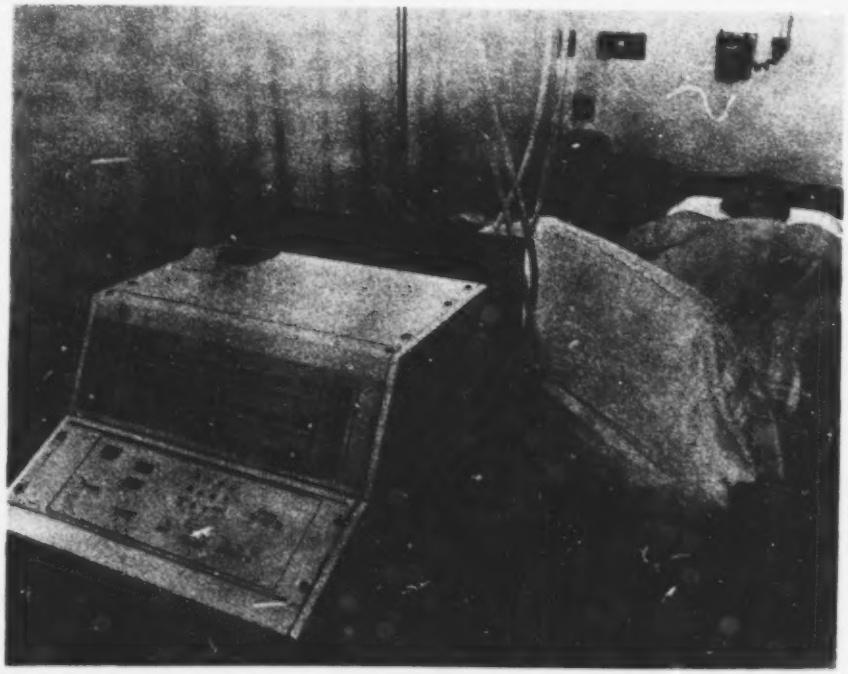
Clinical Physics

Optimal radiotherapy requires accurate radiation dosimetry, a knowledge of the tolerance of normal tissues to radiation and an ability to plan and deliver radiation doses as prescribed by the radiation oncologist. It is rarely possible to make radiation dose measurements in patients and so it is necessary to calculate them taking into account the properties of the radiation beam, the shape of the external surface of the patient, the depth of the tumour and the effect of non-homogeneous tissue structures. The necessity for this information requires a close working relationship between the clinician and physicists and much of the activities of the clinical physics group is devoted to providing this on a day-to-day basis for patients undergoing therapy.

The development of computerized dosage calculation methods has been a major part of the clinical physics effort for many years and this group has contributed extensively to the world literature on the subject. In fact, many of the procedures that are in use throughout the world are the results of developments made at the OCI. Current interest in this area centres around the use of the electron beams from the new linear accelerators.

Another area of current concern is the reduction of radiation exposure to staff. Historically an important source of radiation exposure has been the use of sealed sources for the treatment of gynaecological tumours. Machines called remote afterloading units are available for this purpose. However, since no commercial machine appeared to satisfy the needs of the OCI, a decision was made to design and construct one.

The device produces, within the patient, a linear source consisting of radioactive spheres separated by non-radioactive spacers. Appropriate mixing of sources and spacers allows an almost infinite choice of source configurations. The sources are selected and controlled by a small computer. To reduce staff exposure the sources are directed to a safe storage area while nurses or doctors are tending the patient. Experience so far has indicated that the use of the device greatly reduces staff exposure to radiation.



The calitron, a device used in the treatment of patients with cervical cancer, was designed and built at The Princess Margaret Hospital in order to protect staff from exposure to radiation.

Drugs and Radiation

Drug treatment for some types of solid human tumours has only limited efficacy. Although the cells of some tumours may be intrinsically resistant to anti-cancer drugs, an alternative cause of resistance in others may be failure of drugs to reach the target tumour cells in adequate concentration.

Research at the OCI seeks to determine the distribution of clinically-used anti-cancer drugs within tumours, or in solid tumour nodules (called spheroids) that can be grown in tissue culture. One example of this research concerns the widely-used drug adriamycin. Correlative studies in solid tumours of animals show that the drug has limited effects against cells which are deficient in oxygen, presumably because the drug cannot diffuse to hypoxic cells that are situated at some distance from tumour blood vessels.

If adriamycin and other clinically-used drugs have limited penetration into tumour tissue from blood vessels, they might be used more effectively with other drugs that have better penetration or which are more active against the cells spared by the first drug. Because such cells are at some distance from blood vessels, they probably exist in an environment deficient in blood-borne nutrients such as oxygen or glucose, and may be situated close to necrotic regions characteristic of spontaneous cell death.

Research is underway on the relationship between diffusion of oxygen, glucose and other metabolites and cell death and necrosis in the interior of spheroids. A better understanding of the causes of cell death in untreated tumours may allow the development of drugs which stimulate this natural process and which are selective for cells that are situated in nutritionally-deprived regions of tumours. Such a drug might have restricted anti-tumour activity when used alone, but could lead to marked therapeutic benefit when used with drugs such as adriamycin, because each agent would then be active against the cell population that is spared by the other.

Cancer therapy often makes use of treatment combinations involving radiation and chemotherapy. More and more, chemotherapy is being combined with radiotherapy, both to deal with the problem of small secondary tumours outside the field of radiation treatment as well as with the problem of radiation resistant tumour cells, for example, the oxygen deficient (hypoxic) cells, mentioned above.

Over the last few years, a particular emphasis has been placed on chemicals which sensitize hypoxic cells to radiation and/or are selectively toxic to hypoxic as compared to aerobic cells. Since normal tissue is well oxygenated, this sensitization or toxicity is selective for hypoxic tumour cells.

One class of hypoxic cell radiosensitizers that has been of particular interest is the compounds, such as misonidazole, which contain a nitrogroup. Studies are currently going on at four levels on members of this class of compounds:

i) Studies at the chemical and biochemical levels are focussed on the metabolism and mechanism of action of these compounds at the molecular level.
ii) *In vitro* studies analyze the effects of these drugs alone and in combination with radiation on mammalian cells in tissue culture.
iii) *In vivo* testing in mouse model tumour systems allows the effectiveness of new drugs to be tested in an experimental system closer to their potential use in humans.
iv) Clinical trials of promising new drugs allow a final decision to be made as to the potential effectiveness of these drugs as adjuncts to radiation therapy. A clinical trial of misonidazole in radiation treatment of patients with carcinoma of the cervix is currently underway.

As well as nitrogroup containing compounds, other drugs are under study in combination with radiation at the four levels described above. Two of these compounds are mitomycin-C and 5-fluorouracil which have exhibited beneficial effects when used with radiation in the treatment of a variety of tumour types.

Experimental studies of these compounds indicate that they are not working as hypoxic cell radiosensitizers, although mitomycin-C does show increased toxicity towards hypoxic as compared to aerobic cells. Studies are underway in appropriate experimental systems to see if an improved understanding of the effects of drug-radiation combinations in experimental systems will contribute to the most efficacious clinical use of these combinations.

DNA Repair

DNA repair processes play a critical role in determining the outcome of human exposure to radiation, chemotherapeutic agents, mutagens and carcinogens. Certain individuals, because of rare genetic diseases, lack such repair processes and are exquisitely sensitive to the deleterious effects of such agents.

Much of the current understanding of DNA repair comes from studies in bacteria as a result of the techniques of molecular biology, including gene cloning. Recent advances in the techniques mean that they can be applied to investigating repair processes in mammalian cells and for this reason, members of the research divisions have commenced a joint project with the initial aim of cloning a human DNA repair gene.

Initial studies have demonstrated that it is possible to successfully transfer a human repair gene into repair deficient Chinese hamster cells. The successful transfer of such a gene converts the recipient cells from a state of extreme sensitivity to ultraviolet light and mitomycin-C to a state of essentially normal resistence. Successful transfer of the human gene represents the first step in the attempt to clone the gene, and work is currently in progress to isolate the human DNA involved so that it can be studied in detail.

Molecular Structure and Cellular Chemistry

Developmental work in the laboratory to modify the OCI's high resolution electron microscope has culminated in the perfection of an energy filter system that makes the microscope capable of analysing individual chemical elements in a specimen at a resolution about 100-fold higher than other approaches. Using this system OCI scientists are now probing the three-dimensional fine structure of the chromosome, particularly with regard to the active and inactive portions of the genome.

The earliest stages of calcification during the normal and abnormal development of bone are also being studied; it has been discovered that current thinking on the process has to be changed substantially, towards the involvement of sulphur and away from the primary interaction with phosphate.

Since the modified electron microscope is a unique resource, the Institute has collaborated with an international group of scientists in studies on the leprosy bacterium, fungus infection in plants, silicon metabolism in diatoms, the ribosome structure, on lobster growth, and in materials science on diffusion of metals in semiconductors, inclusions in zirconium cladding in nuclear reactors and impurities near crystal imperfections in metal alloys.

An electron microscope, developed at the Institute, is a unique piece of research equipment which enables scientists to examine genetic structures.

Nuclear Magnetic Resonance (NMR) Imaging

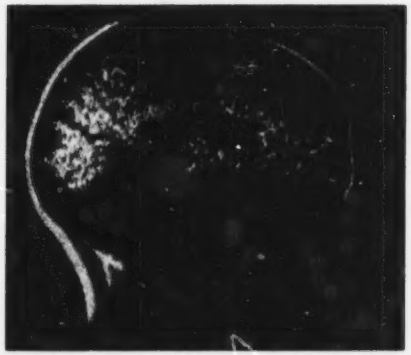
In the past year, The Ontario Cancer Institute has acquired a prototype NMR imager for clinical evaluation. This instrument has been provided through a grant from the Ministry of Health of the Province of Ontario of $1.3 million and has been developed by Technicare Corporation in Ohio.

Over the next two years, this equipment will be used to answer questions about the diagnostic accuracy of this new kind of imaging in managing and diagnosing cancer. NMR imaging does not use x-rays and hence is less sensitive to bone and more sensitive to soft tissue structures. It is, therefore, expected to be valuable in the identification of soft tissue masses.

The clinical protocols involve imaging patients prior to surgery and then scoring the information obtained from the NMR images against the results found by the surgeons at operation. Such a program will allow an assessment of the diagnostic accuracy of NMR imaging to be made.

The clinical evaluation of NMR is a project which involves members of the Departments of Radiation Oncology, Diagnostic Radiology, Physics and Epidemiology.

Since surgical patients must come from other hospitals, the NMR imaging research team has developed collaborative links with Departments of Surgery and Radiology in most of the other Toronto teaching hospitals.



The nuclear magnetic resonance imager produces pictures that are based on the responses of atomic nuclei in a magnetic field.

Health Status

There is a growing recognition of the need to determine patients' preferences in regard to therapy. Systematic approaches are being developed to the quantitation of the values patients give to treatment outcomes in addition to prolonged survival.

For example, patients with laryngeal cancer are being assessed for the importance they place upon the maintenance of voice quality following treatment. Using two quantitative methods, highly reproducible values have been attained over the course of time. These measurements were not influenced by the degree of voice dysfunction experienced by the patients.

A major research objective is to extend these methodologies, developed in patients with an easily measurable outcome variable (quality of voice), to other patient populations, where measurements of different physical or psychosocial functions may contribute to the establishment of treatment policies.

Development and Evaluation of New Therapies

The encouraging results obtained with a combination of radiation therapy and the chemotherapeutic agents 5-FU and mitomycin-C for patients with squamous cell carcinoma of the anal canal has led to the application of this approach to squamous tumours at other sites. Preliminary results for squamous cell carcinomas of the oesophagus and cervix are also encouraging. A major prospective randomized trial of this combination of drugs and radiation for those patients with advanced laryngeal and hypopharyngeal cancers is now underway with the support of a grant from the National Cancer Institute of Canada. It is anticipated that this trial will take about three years to complete.

More than 500 patients are now enrolled in clinical trials of therapy for breast cancer. These trials include a comparison of cyclophosphamide, methotrexate, and 5-fluorouracil (CMF) with chemotherapy and ovarian ablation in the adjuvant treatment of premenopausal women, and a comparison of tamoxifen as adjuvant therapy with no post-operative treatment in postmenopausal women.

Clinical trials in patients with metastatic disease include a randomized comparison of high and low dose CMF, and a randomized comparison of tamoxifen *versus* oophorectomy in premenopausal women. To date, only the trial of tamoxifen as adjuvant therapy in postmenopausal women is mature enough to merit interim analysis.

At the time of analysis 306 patients have been followed for a median of 2.6 years. Overall three-year actuarial relapse-free rates were 62% for the tamoxifen treated group, and 49% for the control group ($p = 0.087$). No differences in overall survival have yet been observed. Estrogen receptor status was known in 195 patients; the improvement in disease-free survival seen for the overall group appears to be confined to those with positive receptors.

Several studies of malignant melanoma have been conducted in collaboration with other Canadian investigators under the auspices of the National Cancer Institute of Canada.

In the first study (ME-1) patients with resected primary melanoma greater than 0.75 mm in depth and with resected lymph node metastases from melanoma were randomized to a control group, a group that received BCG for three years, a group that received levamisole for three years, or a group that received both BCG and levamisole for three years. Entry into this study closed in December 1982 when 577 patients had been randomized to the four groups. To date, no significant difference in relapse free rate or overall survival has been detected between the four groups.

In the second study (ME-2) 65 patients with unresectable metastatic melanoma were treated with vinblastine, bleomycin and cis-platinum. A previous study had reported a 47% response rate to this combination. However, the complete plus partial response rate was only 19% in the OCI study. Major toxicity was seen with this combination. Therefore it was concluded that it was an unsuitable treatment for patients with metastatic melanoma.

At the present time, patients with metastatic melanoma are treated with CCNU, vincristine and procarbazine (ME-3). A 60% response rate to this combination has been reported. To date, 47 patients have been entered on this study. It is still too early to know what the response rate will be.

Since 1977 myeloma patients at The Princess Margaret Hospital have been entered on the clinical trial coordinated by the National Cancer Institute of Canada. During the past six years 423 eligible patients have been registered on this trial. The first objective was to determine whether maintenance therapy during a stable remission improved the quality or the duration of the remission. Only a third of the patients achieved a stable remission and were eligible for randomization. The Institute found that maintenance therapy with intermittent melphalan and prednisone did prolong the duration of the remission somewhat, but had no effect on overall survival.

A secondary objective was to test various alternate forms of treatment for patients who were resistant to melphalan and prednisone initially, and for those who relapsed while receiving maintenance melphalan and prednisone. The OCI has tested intermittent high-dose cyclophosphamide and prednisone, a combination of vincristine, CCNU, adriamycin, and prednisone, and weekly low-dose cyclophosphamide plus 100 mg of prednisone every other day. The Institute found that patients who show primary resistance to melphalan and prednisone rarely respond to second line therapy.

Only three of 32 (9.4%) of patients treated with high-dose cyclophosphamide and prednisone, four of 36 (11.1%) treated with the drug combination, and one of 12 (8.3%) treated with low-dose weekly cyclophosphamide and alternate day prednisone showed an objective response to treatment. The response rate was somewhat higher for patients who respond initially to melphalan and prednisone and then relapse during maintenance therapy, for three of 16 (18.8%) of these patients showed an objective response to the drug combination.

The current myeloma study will be replaced with a trial in which the value of diphosphonates (Didronel) in improving bone strength will be tested. In the proposed new trial interferon will also be tested to determine whether this form of maintenance therapy will prolong the duration of remission and improve survival.

The prognosis for patients with malignant lymphomas varies considerably, depending on the histological pattern. For those with a nodular pattern, or with well differentiated lymphocytic lymphomas, the disease progresses slowly, responds well to minimal treatment, and the survival prognosis is good.

Lymphomas that are composed of poorly differentiated cells arranged in a diffuse pattern have a poorer prognosis. The patients with poor prognosis lymphomas have been entered on another study coordinated

by the National Cancer Institute of Canada in which patients are randomized to treatment with standard doses of a drug combination known as BACOP-SEPTRA, and another group in which the dose of adriamycin is escalated to 150% of the dose used in the standard drug combination.

This is an important study, for the OCI should learn whether there is any value to increasing the dose of a valuable agent to unusually high levels. Many patients have been enrolled in this study, but it is still too early to analyze the results in detail.

The Institute is involved in several new approaches to the treatment of patients with lung cancer, which is one of the most common diagnoses for patients referred to The Princess Margaret Hospital. Almost one-third of the patients referred to the Hospital have an aggressive, disseminated form of the disease classified as small-cell (oat-cell) lung cancer. These patients are treated initially with courses of cyclophosphamide, adriamycin and vincristine, plus courses of VP-16 and cis-platinum, in sequential or alternating schedules. Patients who respond well to this chemotherapy receive prophylactic cranial irradiation and are then randomized to receive medium or high-dose radiation to the area of the primary tumour and the mediastinal lymph nodes.

Several recent studies suggest that radiotherapy to the chest is beneficial in the treatment of small-cell lung cancer, so that the determination of the optimal dose to be used is important. This study is being coordinated by the National Cancer Institute of Canada. It is of interest that this group has decided that maintenance therapy should not be used in this study, because earlier studies by the Toronto group failed to show that maintenance therapy prolonged the duration of the remission or improved overall survival.

Nutritional studies of patients with small-cell lung cancer, conducted in collaboration with Dr. Jeejeebhoy at the Toronto General Hospital, and supported by a contract from the National Institutes of Health, have shown that these patients generate energy by preferentially oxidizing fat and ketoneogenesis, as evidenced by high blood levels of free fatty acids, ß hydroxybutyrate and low respiratory quotients, which are not influenced by the tumour burden or chemotherapy. These changes were attributed to the high blood catecholamine levels which were found in all patients. High blood lactate levels were related to the tumour burden. Abnormalities in plasma amino acid levels probably reflect an increased entry of nitrogen into the urea cycle consistent with hypercatabolism caused by the tumour, rather than inadequate caloric intake. The amino acid abnormalities were improved by total parenteral nutrition, but this treatment did not improve the response to chemotherapy or overall survival.

Similar nutritional studies are now being conducted on patients with non-small-cell lung cancer, and advanced colorectal carcinomas.

Several additional studies have tested the value of new antibiotics in the control of infections in neutropenic and immuno-compromised cancer patients being treated with chemotherapeutic agents.

Another important supportive-care study compares the value of a hormone (Solumedrol) in controlling the nausea and vomiting caused by cancer chemotherapy, with metaclopramide.

The OCI has had considerable success in developing multi-disciplinary clinics for the treatment of several tumour sites. These clinics are attended by surgeons, gynaecologists, radiation and medical oncologists. Multi-disciplinary treatment policies have been developed for patients with carcinoma of the cervix, ovarian carcinoma, soft tissue sarcomas, breast cancer, testicular carcinoma, small-cell carcinoma of the lung, and head and neck cancer.

The results of the prospective randomized trial comparing open beam whole abdominal radiation to abdominal strip radiation for carcinoma of the ovary became available during 1982. These results show both methods of treatment to be equivalent in controlling any residual disease, but the open beam technique takes a much shorter time and is less toxic. Results of this study will undoubtedly allow the wider application of whole abdominal radiation in the management of ovarian carcinoma.

A new study of patients with advanced ovarian carcinoma has been started. These patients are treated initially with six courses of cyclophosphamide, adriamycin and cis-platinum. Patients who achieve a clinical complete remission have a laparotomy, with resection of accessible residual tumour. Those patients who are free of visually-recognizable tumour following the surgery are randomized to receive radiation therapy to the pelvis and abdomen, or three additional courses of chemotherapy. This is an important study testing the value of resecting residual tumour.

A study of the value of combined chemotherapy and radiation therapy for carcinoma of the nasopharynx is nearing completion, with 45 of the projected 50 patients already entered. In this study, patients are treated with two courses of bleomycin, methotrexate and cis-platinum prior to radiotherapy. The response rate to chemotherapy, assessed at the time of starting radiation, is good, with 24 of 28 evaluable patients achieving either a complete or partial response. When these patients are treated with radiation therapy alone, approximately 25% of patients die with distant metastases within two years of starting therapy. Hopefully the chemotherapy will reduce the number of deaths from distant metastases, but it is too early to evaluate this aspect of the trial as yet.

In an effort to decrease treatment-related morbidity, patients with clinical Stage I non-seminomatous testicular tumours have been entered on a surveillance program. Such patients receive no treatment other than orchiectomy, unless there is evidence of disease progression. Such a program is experimental only, and depends on the agreement of patients to be seen each month for careful evaluation, which includes a chest x-ray and measurement of chorionic gonadotrophin and alpha-fetoprotein. Computerized tomography examinations of the abdomen are used to follow the retroperitoneal area, where lymphatic spread may occur, and these are repeated every three months.

To date eight of 20 patients on the study have had disease progression within two to nine months after diagnosis. Radiation therapy for retroperitoneal node recurrence was used for five patients, and the remaining three were treated with chemotherapy. All patients achieved a complete remission. While there is a surprisingly high number of patients (40%) with disease progression following orchiectomy, it is hoped that at least 50% of all patients will not require surgery (lymphadenectomy) or radiation therapy, which was previously used in the treatment of all patients with Stage I disease.

A pilot program to evaluate I^{132} implantation therapy for carcinoma of the prostate was initiated in collaboration with the Department of Urology at the Wellesley Hospital. It is hoped that this program will define the indications for this method of management and help to optimize the management of patients with this disease.

Studies with hypoxic cell radiation sensitizers continue for patients with cancers of the head and neck and carcinoma of the cervix. Phase I studies with misonidazole indicate that this drug is not widely applicable for patients with head and neck cancer. A Phase III clinical trial continues for patients with carcinoma of the cervix and will require several years to complete.

Pilot Studies

Several pilot studies have been initiated to test the value of new approaches to therapy. A clinical and pharmacological study of mitomycin-C in the treatment of patients with recurrent colorectal carcinoma has been completed. Doses of 10 mg/M^2 (3 courses), 15 mg/M^2 (32 courses), and 20 mg/M^2 (2 courses) were administered to 32 patients. Thrombocytopenia was the dose-limiting haematologic toxicity.

The clearance of plasma mitomycin-C was monitored using an HPLC technique. Mitomycin-C was found to disappear from the plasma in biexponential fashion, with a half-life of 7.7 minutes ± 1.8 during the initial rapid (alpha) clearance phase, and a slower (beta) exponential phase with a half-life of 74 minutes ± 17. The concentration × time of the drug in the plasma varied from 18.5 to 72.9 μg/min/mL, and the whole body clearance of drug from the plasma ranged from 23 to 78L/h.

No correlation was found between the severity of the haematological toxicity and the peak plasma level, the half-life of the beta phase, the drug concentration × time, or the total body clearance of the drug. Three of the 27 evaluable patients (11%) had a partial response to therapy.

It is concluded that mitomycin-C has similar activity to 5-fluorouracil in the treatment of recurrent colorectal carcinoma, and that plasma pharmacokinetics of mitomycin-C do not predict for haematologic toxicity.

Patients with advanced, measureable, metastatic gastric carcinoma were treated with a combination of adriamycin 50 mg/M^2 every three weeks, and mitomycin-C 10 mg/M^2 every six weeks. Objective responses were observed in only two of 29 evaluable patients. This response rate is less than the 20 to 40% response rate which has been reported for the combination of 5-fluorouracil, adriamycin and mitomycin-C.

The results of treating patients with advanced carcinoma of the cervix have been more successful. Fifty-four patients have been treated with a combination of methotrexate, adriamycin and cis-platinum; 38% of these patients achieved a partial response. Patients with small-cell carcinoma of the cervix responded especially well; five previously untreated patients responded to their initial chemotherapy, received radiation therapy, and are alive without clinical evidence of recurrence for four to 24 months after the completion of therapy. This integrated approach with radiation therapy to the treatment of small-cell carcinoma of the cervix is worthy of further study.

Phase II studies have been done on several new agents; diaziquone (AZQ), bisantrene, ametantrone and spirogermanium. Three of the nine evaluable brain tumours treated with AZQ have shown a partial response, but other tumours have shown only occasional partial responses. No objective responses were observed in any of the 11 patients with small-cell carcinoma of the lung treated with bisantrene. The studies with ametantrone and spirogermanium are still too early to be analyzed.

The Institute has been aware of marked variation in the reporting of response rates when similar types of chemotherapy have been used to treat similar types of human tumours. The OCI has studied the variability of response rates by considering the influence of measurement error in the reporting of responses to chemotherapy. This study was undertaken by asking volunteers from the staff and housestaff of the Department of Medicine at The Princess Margaret Hospital to measure identical lesions that were simulated, or were actual nodules in patients. Comparisons of these measurements has shown considerable variability, and has allowed the calculation of probable errors in response rate based on measurement alone. Based on these errors, the Institute is proposing new and improved criteria of response that will be more stringent, and will reduce the effect of measurement error.

Acute Myelogenous Leukemia (AML)

During the past year a clinical trial of remission induction for adult AML has been completed and analyzed. Forty-two patients have been treated with doxorubicin, cytosine arabinoside and 6-thioguanine, with a response rate of 55%. This response rate was similar to that achieved in two previous sequential trials using different chemotherapy regimes. Survival in the present trial is the same as in the previous trials. An analysis of patient characteristics with prognostic significance shows that they are similar in the three patient populations, indicating that comparisons using these three sequential trials are valid.

Clinical and laboratory attributes have been further analyzed to identify variables with prognostic significance using methods of multivariant analysis. Clinical attributes were not consistently related to outcome, and were of little importance in the most recent trial. In contrast, a biological property of leukemic blasts, the capacity to self-renew in culture, was highly predictive of both response and duration of survival. These studies suggest that biological factors play a major role in the determination of outcome in AML, and that further therapeutic advances will depend on the development of innovative treatments.

Retrospective Analyses

In collaboration with the Department of Biostatistics, the ENT Head and Neck Group has almost completed a major review of treatment results achieved during the 1970's in over 5,000 patients with head and neck tumours. These reviews highlight the value of radiation therapy for carcinomas of the oral cavity, pharynx, tonsil, hypopharynx and larynx. As such, they represent the largest experience available in any single institution in Canada or the United States in the treatment of these diseases with radiation therapy.

These reviews also confirm the excellent results attainable with radiation therapy as primary treatment for juvenile nasopharyngeal angiofibromas and glomus tumours of the head and neck region. A disappointing feature of these reviews was the finding that up to 4% per year of patients with head and neck cancer who are cured will develop a second malignancy of the upper aero-digestive tract. It appears that this is due mainly to the continuation of life style of excess alcohol ingestion and cigarette smoking in this patient population.

Major retrospective reviews by the Genitourinary Group involving recent results of carcinoma of the prostate and testis were completed. For patients with testicular seminoma it has been found that the serum markers, alphafetaprotein and beta human choriogonadotrophin (beta HCG) have a very useful prognostic value. Patients with elevated levels of these markers have a significantly worse survival. It is hoped that this will allow additional, and hopefully curative strategies to be employed in this subset of patients.

Major retrospective analyses for carcinomas of the rectum and anal canal were published by the Gastro-intestinal Tumour Group. These studies confirm a role for radiation therapy in the treatment of mobile carcinomas of the rectum. The results obtained confirm those obtained in the period between 1960 and 1970 and represent a unique experience in the application of radiation therapy for this disease.

A major retrospective analysis of the results of the treatment for carcinoma of the cervix was completed. This confirms the high cure rates for early stages of the disease and it clearly identifies a subset of patients with Stage III disease who have poor control rates with conventional treatment.

A multivariate analysis of prognostic factors for ovarian cancer was completed. This has advanced the understanding of this disease and in particular, identifies the relative importance of the various prognostic factors and their inter-relationship. This information will be of major benefit in the design of future prospective studies.

Bone Marrow Transplantation

Bone marrow transplants have been done at The Princess Margaret Hospital since 1970. The original attempts on patients with aplastic anemia and acute leukemia unresponsive to further chemotherapy, clearly indicated that marrow transplantation is most successful during early stages of the disease. Based on this experience, protocols were designed in 1979 for patients with aplastic anemia, acute leukemia and chronic myelogenous leukemia. Forty-four of 84 patients transplanted since 1979 are currently alive and free of disease (Table I).

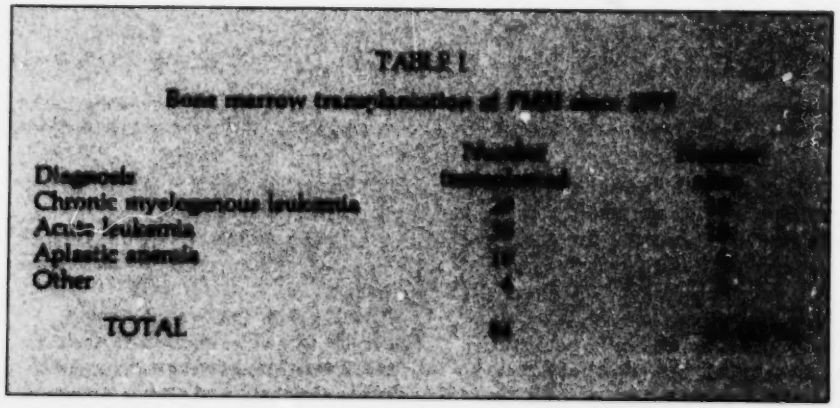


TABLE I

Bone marrow transplantation at [illegible] since 1970

Diagnosis	Number transplanted	
Chronic myelogenous leukemia	2	
Acute leukemia	35	
Aplastic anemia	16	
Other	4	
TOTAL	84	

Bone marrow is taken from a compatible donor for subsequent transplantation to the patient. The procedure is performed in the operating room under a general anaesthetic.

The main risk factors determining survival include age of the patient at the time of transplantation and the status of the underlying disease. The survival of patients below the age of 30 is significantly better than for older patients, and only occasional long-term survivors have been observed among patients over the age of 40. This age-dependent probability of survival may reflect altered tolerance to the aggressive preparatory treatment with high-dose chemotherapy and total body irradiation.

In addition, the frequency and severity of graft-*versus*-host disease increases with age. Transplantation during the early and stable phases of the disease were more successful than transplants during advanced stages when the disease is resistant to therapy. The observed failures were mainly due to transplant-related complications such as graft-*versus*-host disease and fatal infections.

Recurrence of the primary malignancy was only observed in four of 68 transplanted patients. In all four cases, the transplant was performed during poorly controlled, or advanced stages of the disease.

In an effort to reduce the severity of graft-*versus*-host disease, the Hospital has recently started to use cyclosporin-A. Three patients have now been treated with this drug, and in all there has been improvement in one or more aspects of the graft-*versus*-host reaction.

In the few patients who have recurrence of their leukemia following transplantation, it is always of interest to determine whether the leukemia has recurred in host or donor cells. This determination is relatively easy when the host and donor are of different sex, but it can be difficult when they are of the same sex. A recent leukemic patient relapsed six months after receiving a marrow transplant from his brother. Using molecular probes to identify gene rearrangement in the DNA of the leukemic cells it was possible to show that the leukemic cells were of host origin, whereas both T-cells and granulocytes were of donor origin.

The incidence and type of infection has been analyzed for the first 58 consecutive allogenic marrow transplants at The Princess Margaret Hospital. The patient population consisted of 15 chronic myelogenous leukemia patients 20 with acute leukemia, 17 with aplastic anemia, and one with T-cell lymphoma. The diagnosis of infection required both appropriate clinical findings and positive culture, serology or histology.

The three patient groups had a similar incidence of infections. Twenty-four patients have died of proven infections. In 15 of these patients, infection occurred within six months of marrow transplantation, and was super-imposed on severe graft-*versus*-host disease. Of interest, the incidence of bacterial infection remained constant throughout the first year after marrow transplant.

Fungal infections have occurred most often between one and four months post transplant; these have occurred usually in patients receiving immuno-suppressive therapy for severe graft-*versus*-host disease.

Viral infections have been seen with increasing frequency with time after transplant. They have occurred in 11% of patients during the first six months, in an additional 21% between six and 16 months, and in a further 26% of patients surviving during the second year. Sudden, rapidly progressive infections with septicemia have been late events in six patients, and responsible for the deaths of four.

The findings demonstrate that infection is a major cause of morbidity and mortality after bone marrow transplantation. These studies indicate the importance of improving mechanisms of infection control, including the better management of acute graft-*versus*-host disease. The late occurrence of infections indicates that there are per-

sistent defects in host defence mechanisms persisting after bone marrow transplantations.

Psychosocial Care

Patients in a cancer hospital are subjected to many unusual psychosocial stresses. A serious example of this problem has become apparent on the bone marrow transplantation unit.

Patients undergoing bone marrow transplantation are placed in reverse isolation, and hospital personnel and visitors are required to wash and wear gowns and masks during visits. This is done in an effort to prevent the introduction of organisms into the patient's environment.

Some patients become so terrified of developing an infection that they refuse to leave the isolation room after the transplant; others continue with a scrupulous attention to cleanliness and avoidance of crowds which makes it difficult for them to adapt to their life at home after they leave the Hospital.

The Hospital's psychosocial care team is now attempting to play a preventive role in the management of these patients by seeing them before the marrow transplant preparation begins, and attempting to relieve stress through an education program.

The psychosocial care team also plays an active role in helping other patients and staff deal with stress. A research project has been initiated to assess the biopsychosocial responses of patients with testicular cancer, which should tell a great deal about the adaptation to illness.

Quality of Life Studies

Studies on the quality of life of patients receiving treatment for cancer have so far been concerned only with methodologic aspects of assessment. The Institute has recently completed an evaluation of the reliability and validity of linear analogue self-assessment (LASA) as a method of assessing the quality of life of patients with metastatic breast cancer.

Data were collected from 139 patients with metastatic breast cancer who completed 32 linear analogue scales, comprising a group of scales to assess overall features of life, and a group directed at common problems in breast cancer.

The first group was drawn from the Sickness Impact Profile, an extensively evaluated but time-consuming measure of functional status, and included six scales to assess work, housework, physical activity, social and family life, recreation, depression, anxiety, anger, and nine others.

The second group was selected after interviews with breast cancer patients and included pain, dyspoena, fatigue, bodily appearance, nausea, vomiting, hair loss and six others.

Assessment of test–retest reliability in 139 patients with metastatic breast cancer showed correlation coefficients of greater than 0.7 for most items, indicating a high degree of reliability. Mean completion time for the 32 items was 3.6 minutes.

Assessment of validity by comparing the LASA scores with the independent assessment of physicians, with Sickness Impact Profile scores, and with clinical status, also showed highly significant correlations.

LASA thus appears to offer a rapid, feasible, reliable and valid method for assessing aspects of the quality of life of patients with metastatic breast cancer. Studies are now in progress to assess the reliability and validity of LASA in other clinical settings, as well as to assess the sensitivity of LASA to change in clinical status.

Dental Services

In 1982 there was an expansion of dental services within The Princess Margaret Hospital. A formal dental clinic staffed by a dentist appointed to the active medical staff of the Hospital is now open. This will provide a comprehensive service to cancer patients, in particular the many patients with head and neck cancer who require expert dental consultation as part of their cancer therapy.

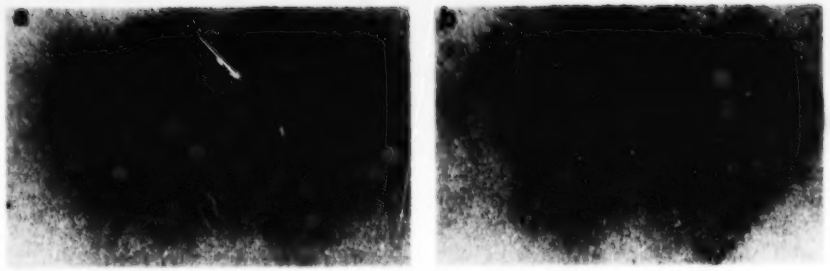
Many patients with cancer benefit from the expanded dental service.

Diagnostic Imaging

This year the Department of Nuclear Medicine has acquired the capability of ventilation imaging which complements lung perfusion imaging in the establishment or exclusion of the diagnosis of pulmonary embolism. The use previously of radioactive gases such as ^{131}Xe has been associated with considerable logistic problems of collection and disposal to reduce environmental contamination. Recent developments have shown that a finely nebulized solution of ^{99m}Tc labelled agents delivered through a simple device forms a very effective aerosal for obtaining good quality ventilation images of the lungs. The addition of this facility will increase the accuracy of diagnosis in patients suspected to have pulmonary embolism and will also provide a method of studying patients with ventilation impairment due to a variety of pathologic processes.

A technique for studying gastric emptying time is being implemented in collaboration with the gastro-enterologists at the Wellesley Hospital.

Although many studies in nuclear medicine continue to provide anatomic and structural information regarding organ integrity, the unique feature of this discipline is the ease with which dynamic information can be acquired, quantitated and evaluated through tracer methodology, which may never be supplanted or surpassed by newer developments in imaging technology.



The perfusion lung scan (a) shows multiple, ill-defined areas of diminished uptake, or perfusion defects. They are compatible with pulmonary emboli (blood clots in lung). With the addition of the ventilation scan (b), the corresponding ventilation defects indicate that underlying pulmonary disease, not necessarily emboli, is responsible for the abnormalities seen on the perfusion lung scan.

Ongoing evaluation of internal mammary lymphoscintigraphy provides further clinical evidence of the efficacy of this technique in assessing and managing patients with breast carcinoma.

Computerized tomography (CT) examinations for the year totalled 1,192 of the head and 3,902 of the body. This is an increase of 20% over 1981 - 82. In November 1982 the working day for the equipment was extended to a full 12 hours from 8:00 a.m. to 8:00 p.m. As a result the increased workload has been handled without any increase in waiting time for the patients. Furthermore there is the potential to accommodate a further 10% increase in workload during the year 1983 - 84, if required.

Trends in general diagnostic radiology are toward stable numbers, with lymphography, barium studies and mammography showing no significant change. There has been a moderate increase in myelography but a significant further decrease in the demand for angiography. The Department received a good report from the X-Ray Inspection Service of the Ministry of Health and was complimented on its interest in quality assurance.

The ultrasound division has continued to provide abdominal, transrectal and ophthalmic ultrasound services. There is increasing interest in the contribution which ultrasound can make to ophthalmology, urology and the diagnosis of disorders of the biliary system. Technological updating has begun and will be continued in these specific areas. This will include "real time" abdominal ultrasound.

Members of the Toronto Institute of Medical Technology made a site visit and expressed interest in cooperation between the ultrasound division and the TIMT training program. There is a continuing interest in the development of ultrasound equipment for breast cancer detection.

Main areas of research effort within the Department of Diagnostic Radiology over the past year have been directed to:

i) an interdisciplinary approach to the use of magnetic resonance imaging in oncology.
ii) a continuing audit of diagnostic imaging through the medium of observer variation studies.
iii) the contribution which digital radiography will make to the future needs of oncology.

The thermography division has remained active and, in addition to breast cancer detection, has provided increasing services to patients from other disciplines, most notably in the areas of musculoskeletal and vascular disorders.

Diagnostic Laboratory Services

The Department of Pathology encompasses the divisions of anatomical pathology, clinical biochemistry, haematology, blood bank and the intravenous nurse service. It performed 4,366,270 Statistics Canada laboratory work units during the fiscal year which represented a reduction of 7.8% over the previous year. This represented 692,286 individual test procedures. The haematology laboratory received its licence to perform the tests for lymphocyte markers as these procedures had become part of the routine service.

There has been an increase of 20% in computerized tomography (CT) examinations from last year.

To support the expanding services to the two hospitals in anatomical pathology, Drs. A. Kossakowska and C. Bergeron were added to the medical staff. Dr. Kossakowska will continue her interest in the study of neoplasms of the lymphoreticular system. Dr. Bergeron devotes half of her time to the brain bank at the University of Toronto and her interest is in degenerative diseases of the central nervous system in association with the Neurosciences Division at the Wellesley Hospital. Already, they have contributed significantly to the post-graduate training endeavours of the Department.

The Department of Medical Microbiology increased its activity in routine diagnostic microbiology by 3% and in research by 6%. Support of clinical trials of new antibiotics comprised part of the research but most of the work was directed to the evaluation of tests to determine whether staff preparing doses of chemotherapeutic drugs are at risk of absorbing significant quantities of these toxic substances. This project is scheduled for completion in 1983 - 84.

The Department of Radiotherapy

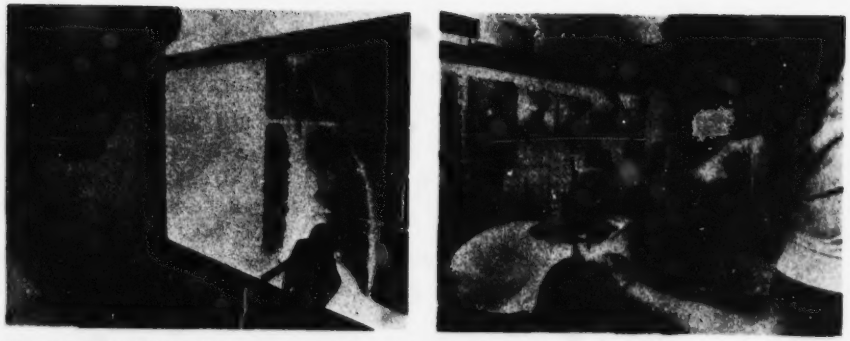
(Each year the OCI reports on one Hospital Department. The Department of Radiotherapy has been selected for this year's Annual Report).

The Department of Radiotherapy plays a major role in the successful treatment of cancer. The majority of patients are referred to this Institute to receive radiation treatments.

The mandate of the Department is to deliver accurately to each patient a course of radiation treatments as prescribed by the radiation oncologists. However, the treatment of a patient involves more than the administration of radiation; it requires a complete network of support groups to interact, through the Department, with each patient. This is especially important since the majority of patients are outpatients and their contact with other departments within the Institute is extremely limited.

The services offered to outpatients undergoing radiation treatments can include some or all of the following:

i) Transportation to The Princess Margaret Hospital for daily treatments. All patients who are unable to arrange their own transportation can use the service provided by volunteer drivers from the Canadian Cancer Society.



The strength of the Department of Radiotherapy is its highly skilled staff. Left, a therapy radiographer checks a planning film while another staff member, right, works on a plaster cast.

A new state-of-the-art linear accelerator, a Therac 6, has been installed to provide greater flexibility for treating patients.

ii) A support nurse, working with the ear nose and throat (ENT) specialists, is responsible for the extra nursing care required by most of the ENT patients receiving radiation treatment. These patients are at risk of developing complications which could compromise their treatment.

iii) Group discussions are held in the Department on a weekly basis for all radiotherapy patients, their families, and their friends. The groups are conducted by members of the technical and nursing staff of the Department.

iv) A therapy radiographer is specially assigned to work with the paediatric patients not only to provide consistency of care but to become a familiar face while children are undergoing their treatment.

v) The Nutrition Department provides the radiotherapy patients with a counselling service on nutrition and special diets. This is especially important for ENT patients who may experience rather severe reactions to their treatment.

While these are some of the support services provided to the patients who are receiving radiation treatments, essentially all departments interact to some degree with the Department of Radiotherapy.

During the past year, the Radiotherapy Department has undergone some major physical alterations:

- Two aging cobalt units (Xotron and Double Header), both designed and constructed at OCI, were retired from service.
- A second simulator (Therasim 750) supplied by Atomic Energy of Canada Limited (AECL) was installed on the first floor, creating a complete simulation suite. This is a state-of-the-art simulator and is an invaluable tool for the simulation of increasingly more complex treatment setups in use today.
- A new 6 MeV linear accelerator (AECL's Therac 6) was installed in the room vacated by the Xotron on the first floor. Again, this is a state-of-the-art machine, designed to provide greater flexibility in treatment techniques. This accelerator is capable of treating the same numbers of patients daily as were previously treated by the Xotron and Double Header combined.
- Plans are currently underway for the removal of the Betatron in the basement and the installation of a 25 MeV linear accelerator in its place.

Despite all these changes, there has been little disruption of the services provided by the Department.

The strength of the Radiotherapy Department is its staff, most of whom are therapy radiographers. These are highly skilled and qualified technologists who provide sensitive care for patients and superior technical assistance to radiation oncologists.

The Department's working hours are 8:00 a.m. to 6:00 p.m., Monday through Friday, and a therapy radiographer is on call for any emergency arising during off hours and weekends.

Volunteer Services

The Princess Margaret Auxiliary volunteers continue to support both patients and staff in over 35 services in the Hospital and the Lodge.

The new ambulance holding area in the Outpatient Department now has a volunteer on duty, Monday to Friday, to assist the patients who are being transported to and from the Hospital by ambulance. Another expanded volunteer service is the diversional activities program in both the Hospital and Lodge.

During the past year the volunteers' kitchen was moved from the first floor to the second floor because of the necessary expansion of the Admitting Department in the first floor area. Volunteers who operate the tea cart service have been extremely cooperative adjusting to the move to a smaller working space.

Proceeds from the Hospital Gift Shop were used to renovate the Hospital's Lecture Theatre. This donation represents many hours of work by dedicted Gift Shop volunteers. Proceeds from the Daffodil Boutique in the Lodge are used to support patient services at the Lodge.

During the Christmas season, and in response to requests throughout the year, 416 Sunshine Baskets were assembled and distributed to patients at PMH and the Lodge. Sunshine Baskets were also given to members of The Toronto Lost Chord Club and to patients in the palliative care unit at the Salvation Army Toronto Grace Hospital. In the spring, 227 Easter Bags were assembled and distributed to Hospital and Lodge patients.

Volunteers continue to show their enthusiasm for the work that they undertake. "Ready, Willing and Mabel", a skit written, produced and presented by volunteers, was received with much laughter by everyone who attended the Hospital's Christmas Concert. In addition, slide presentations of The Princess Margaret Hospital and Lodge Auxiliary services were given at annual meetings of the Canadian Cancer Society North Durham and Victoria-Haliburton units during the autumn months.

The Auxiliary's Princess Margaret Day symposium was held in January, 1983 for Canadian Cancer Society staff and volunteers, the Auxiliary Presidents of Region Six hospitals, and PMH Auxiliary volunteers.

The continued financial support of The Princess Margaret Hospital Auxiliary by the Canadian Cancer Society, Ontario Division, enables volunteers and staff to maintain their high standards of service to patients. The Auxiliary looks forward to expanding its volunteer services throughout the next year.

Left: volunteers who operate the tea cart service have been extremely cooperative in adjusting to the move to smaller quarters. At Christmas, Hospital and Lodge patients receive Sunshine Baskets, which are assembled and distributed by the volunteers, right.

The well-stocked Hospital Gift Shop offers one-stop shopping. Proceeds from the Shop were used to renovate the Hospital's Lecture Theatre.

EDUCATION REPORT

Undergraduate Medical Education

In recent years, concern has been repeatedly expressed to members of the University of Toronto Undergraduate Curriculum Committee that undergraduate medical students receive inadequate clinical teaching of malignant disease. These concerns were confirmed by a detailed review of the undergraduate curriculum, which revealed no formal teaching of oncology in most clinical areas, notable exceptions being respirology, haematology and the genitourinary system (including gynaecology). There is adequate oncology teaching in pathology, community health and preventive medicine. Most disturbingly, there is no formal arrangement whereby exposure of undergraduate medical students to cancer patients is ensured.

In a survey of all Canadian medical schools, the University of Toronto ranks amongst the least adequate in terms of assigned time for oncology teaching, both in academic sessions and at the bedside.

This report was reviewed with the Undergraduate Curriculum Committee, some members of which expressed a strong desire to increase the oncology content. Currently, the undergraduate curriculum is undergoing a thorough review in all areas, and it is hoped that the teaching of oncology will receive much greater emphasis in the new curriculum.

In 1982 - 83, there were 16 undergraduate medical students who undertook electives at The Princess Margaret Hospital. Thirteen were from the University of Toronto and three were from other Canadian universities.

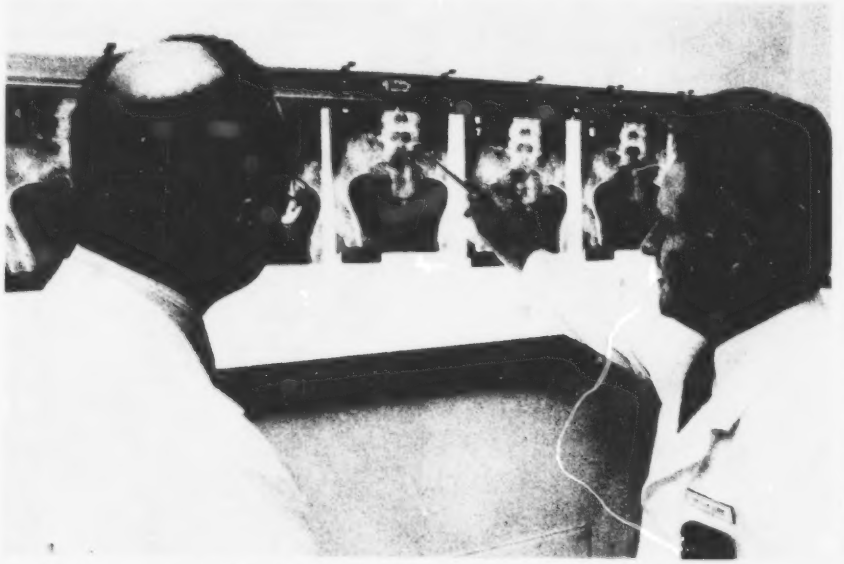
Postgraduate Medical Education

The University of Toronto demonstrated its concern for the training of radiation oncologists by providing three additional resident posts funded by the Ministry of Health (MOH) beginning in July 1983, raising the total number of MOH funded posts to 17. Although there was no increase in the number of MOH funded posts in medical oncology, two additional posts were funded by The Ontario Cancer Treatment and Research Foundation, raising the total number of medical oncology posts to 11. There were five clinical fellows in radiation oncology and eight clinical fellows and three research fellows in the Department of Medicine. In the Pathology Department, there were six residents.

A major change in the format of the teaching of tumour pathology was made in the 1982 - 83 academic year, leading to more active participation by the oncology residents. In March 1983, the Royal College of Physicians and Surgeons of Canada reviewed all University of Toronto specialty programs, and approved the radiation oncology and medical oncology programs based at The Princess Margaret Hospital and the Toronto Bayview Clinic.

In 1982, four Toronto trainees obtained specialist certificates in radiation oncology from the Royal College of Physicians and Surgeons of Canada, and four passed the American Board Examinations in radiation oncology. Ten clinical oncology trainees passed the Royal College's specialty examinations in internal medicine.

Residents from Queen's University, Stanford University, University of Alberta and University of Western Ontario spent elective periods in the Department of Radiation Oncology, in addition to five University of Toronto family practice residents and one Memorial University resident who spent an elective in medical oncology.



Residents come to the Hospital for specialized training in medical and radiation oncology.

Terry Fox Training Centre

The Terry Fox postgraduate program, one of the special projects funded through the Terry Fox Marathon of Hope, has been in operation at the Institute for just under two years. This program incorporates a comprehensive postdoctoral training program for all postdoctoral fellows in the Institute. It continues to attract applications from M.D.s and Ph.D.s throughout the world who are eager to obtain cancer research experience in the Institute.

Since the program's inception, five Terry Fox fellows have taken up their awards; of these, two have now left,

and the other three are still actively engaged in their projects. An additional 11 individuals, who have been awarded fellowships, will begin research during the next year.

The OCI is pleased with the success of this new program, and particularly with the many applications from M.D.s interested in obtaining training in various areas of cancer research. The participants in this training program are highly motivated and capable clinical scientists, and the Institute is confident that when these trainees complete their research here, they will establish their own research programs and will make major contributions to cancer treatment and research in Canada.

Medical Biophysics

The Department of Medical Biophysics, University of Toronto, primarily located in the research divisions at The Ontario Cancer Institute, has continued to be very active in attracting first rate graduate students and postdoctoral fellows into cancer research. OCI staff have continued to teach graduate courses both at the Institute and on campus, and again last summer, sponsored and participated in a vigorous summer student training program for promising undergraduates in the 3rd and 4th years of university. During the last year 26 postdoctoral fellows received further research experience in the Department, and 37 graduate students were working in the various laboratories. Of these 37 graduate students, three have completed the Ph.D. degree and three the M.Sc. degree.

School of Radiotherapeutic Technology

During 1982 four students graduated from the School of Radiotherapeutic Technology, all of whom successfully passed the national examinations of the Canadian Association of Medical Radiation Technologists. One staff member was successful in completing the Advanced Certification program of the same Society.

In September, ten new students were accepted into the program, making a total of 18 students currently in training. In addition, 11 students are attending the didactic portion of the program from affiliated clinics of The Ontario Cancer Treatment and Research Foundation in Nova Scotia, New Brunswick and Saskatchewan. In 1982, the first students from the Saskatchewan Cancer Foundation were welcomed; the OCI is pleased to be able to assist that province with its staffing needs.

Once again a very successful in-service lecture series was held for graduate staff, with radiographers attending one evening per week for 15 weeks. Thanks go to the staff members who contributed their time to speak to the graduate staff of the Department.

During the year a survey of all cancer centres in Canada was completed to assess the need for staff. It appears that the number of students currently in training will satisfy the staffing needs over the next five years, with only a few areas of the country currently showing significant vacancies. The attraction of employment in the U.S., where there is still a big shortage of qualified individuals, may alter the balance somewhat, although the training schools within Canada are able to increase their student population at short notice.

Nursing

In 1982 the education activities of the Nursing Department focused once again on student, staff and visitor programs.

Seventy nursing students from Durham College joined the Hospital for three days clinical experience. Another 100 students from various community colleges spent one-half day touring the facility and learning about cancer nursing. There were six undergraduate students from the University of Toronto Nursing program and one post-basic student from the Ryerson Nursing Degree program.

A highlight of staff education has been the development of programs designed to support staff in the development of their role as oncology nurses. One program is designed for newly appointed staff and focuses on easing staff into their work environment. A feedback discussion session is held during the first three months to determine how the nurse is adjusting to the Hospital setting. At the end of six months these staff participate in a seminar day designed to allow them to share experiences and express their concerns. Resource staff are there to offer specific guidance on how to handle situations in their work setting as well as how to cope with personal stress.

The second program is titled 'Educational Study Days' and is designed to give staff a greater insight into the management and care of the patient with cancer. Staff are given the opportunity to spend time in Diagnostic Radiology, Radiation Therapy, Outpatient Department (OPD), the Lodge and the palliative care unit at the Salvation Army Toronto Grace Hospital. These programs have been developed as a result of needs identified by staff and have been very positively received.

The increasing demand for maintaining and increasing knowledge in this specialty has necessitated the appointment of a teacher for the bone marrow transplant program and a part-time teacher for ambulatory nursing care.

In conjunction with the I.V. team and the nurses in Day Care, an I.V. certification program has been developed for OPD nursing staff. The new program format allows for qualification in a shorter period of time.

A special unit orientation program has been developed for new staff on the bone marrow transplant unit.

The Hospital received 40 visitors from across the country and abroad for a period varying from one-half day to five days. Visitors came from as close as North York and from as far away as New Zealand. Nursing staff continue to benefit from this mutual professional exchange.

The Hospital's role as a resource in oncology nursing is constantly being reinforced by the number of requests received for information and resource speakers.

STATISTICS

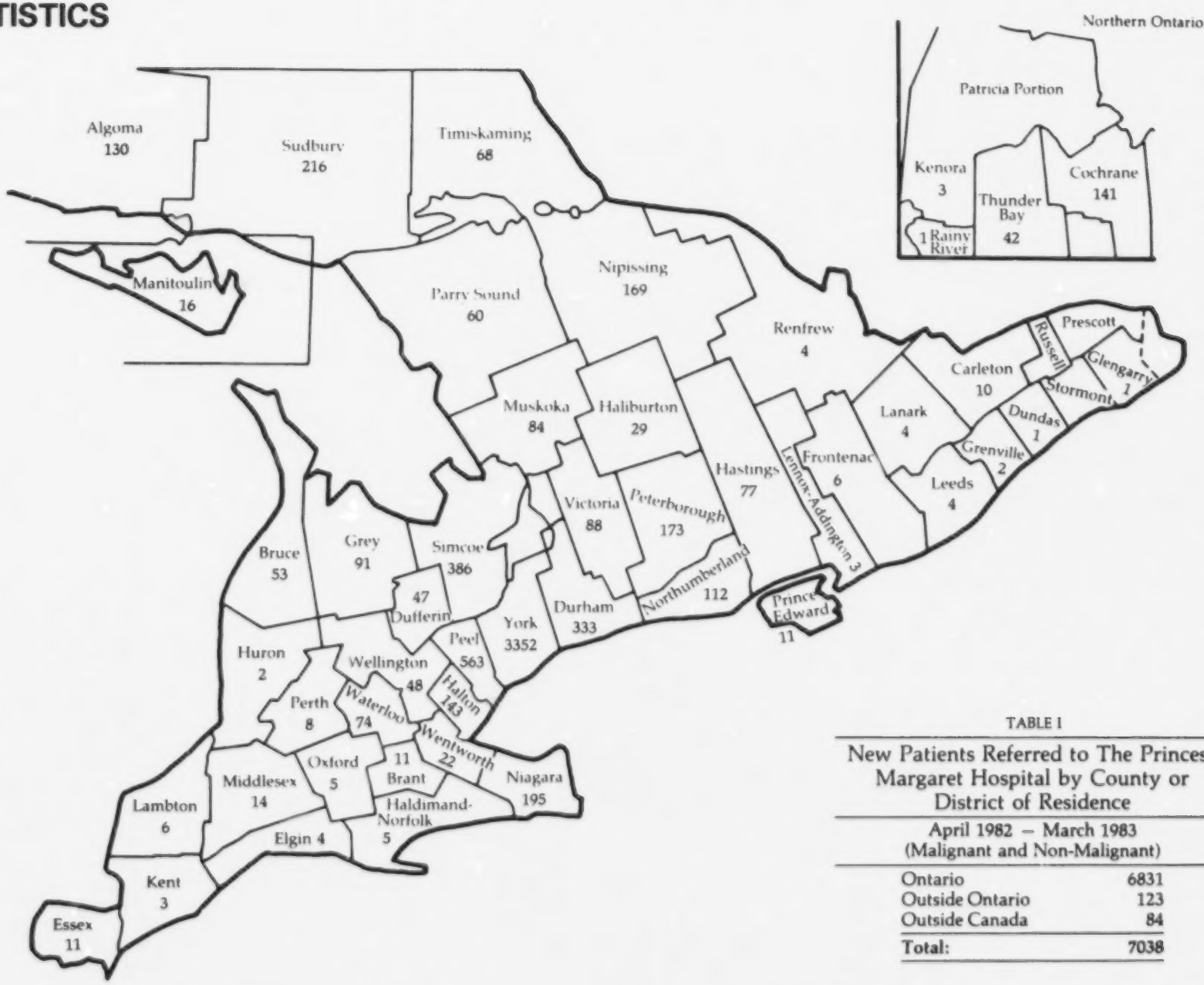


TABLE I

New Patients Referred to The Princess Margaret Hospital by County or District of Residence

April 1982 – March 1983
(Malignant and Non-Malignant)

Ontario	6831
Outside Ontario	123
Outside Canada	84
Total:	**7038**

TABLE II

New Patients with Malignant Disease – Distribution by Age and Sex

April 1982 – March 1983

Age	*Male*	*Female*	*Total*
Under 1	4	4	8
1-4	31	19	50
5-9	19	14	33
10-14	12	13	25
15-19	42	11	53
20-29	108	97	205
30-39	152	266	418
40-49	263	478	741
50-59	702	779	1481
60-69	971	900	1871
70-79	692	577	1269
80-89	186	216	402
90-99	17	28	45
Total	**3199**	**3402**	**6601**

TABLE III

Cases of Malignant Disease Distribution by Site of Malignancy and Sex

April 1982 – March 1983

Site	*Male*	*Female*	*Total*
Lip	38	7	45
Tongue	61	23	84
Rest of Mouth	82	53	135
Pharynx & Tonsil	95	48	143
Oesophagus	53	27	80
Stomach	50	27	77
Intestine – except rectum	101	104	205
Rectum & anal canal	187	121	308
Other digestive system	51	42	93
Nose, middle ear & Acc. sinus	17	12	29
Larynx	143	24	167
Lung, bronchus & trachea	806	323	1129
Other respiratory system	13	11	24
Bone	11	7	18
Connective & other soft tissue	37	22	59
Malignant melanoma (skin)	74	65	139
Other cancer of the skin	380	269	649
Breast	8	1092	1100
Cervix uteri	0	216	216
Other uterus	0	234	234
Ovary, tubes & ligament	0	208	208
Other female genital organs	0	20	20
Prostate	303	0	303
Other male genital organs	92	0	92
Bladder	153	61	214
Kidney, ureter & urethra	55	40	95
Brain & nervous system	109	59	168
Thyroid gland	16	34	50
Secondary carcinoma	121	125	246
Hodgkin's disease	84	55	139
Other lymphomas	140	137	277
Leukemia	92	51	143
Other sites	97	99	196
Total malignant cases:	3469	3616	7085*
Cases of non-malignant disease:	189	264	453+
Total	**3658**	**3880**	**7538**

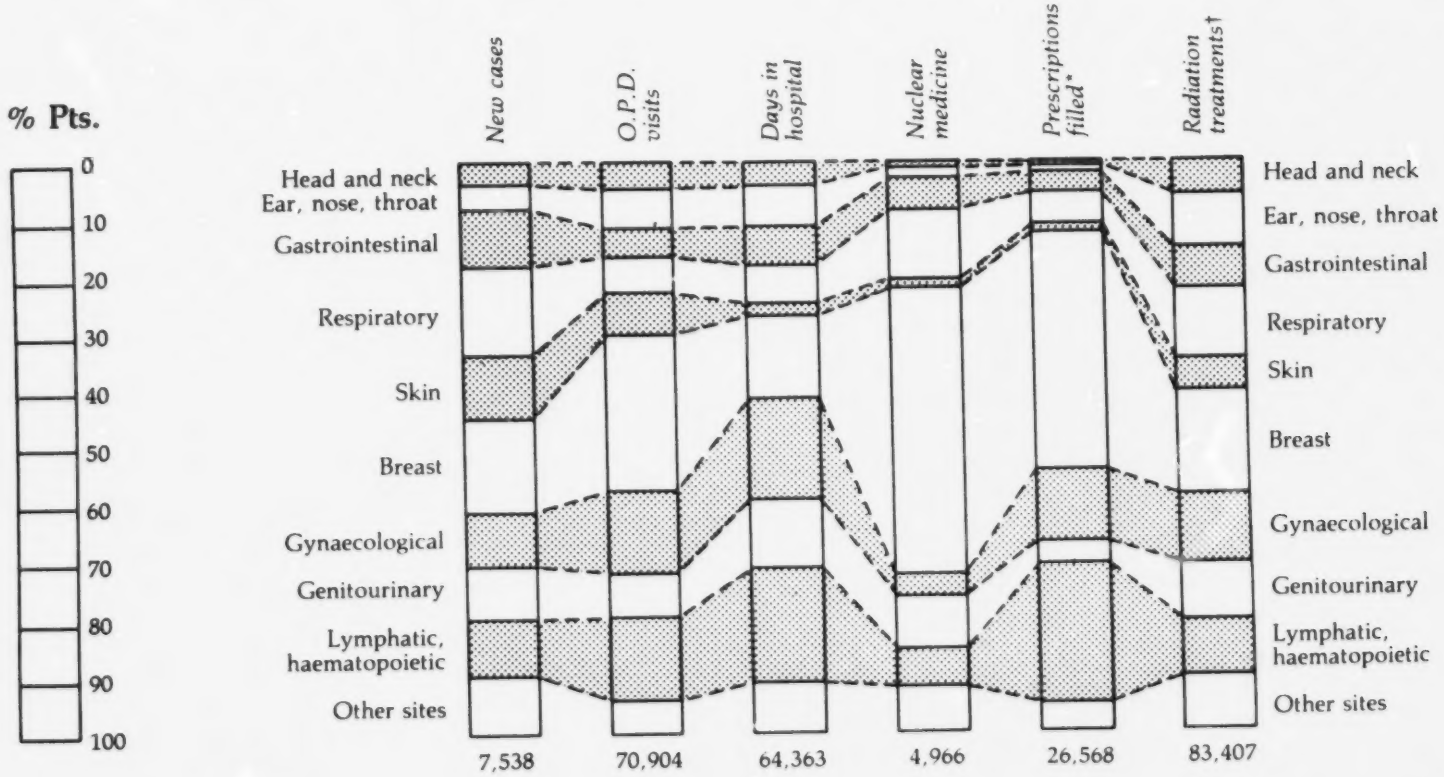
* *Number of malignant cases differs from number of new patients with malignant disease because this table includes multiple entries for patients having more than one malignancy during the specified time period, as well as new malignancies in patients registered previously.*

\+ *Includes cases seen in the diagnostic breast clinic and the medullary thyroid carcinoma screening clinic.*

TABLE IV

Hospital Workload by Site of Disease

(Percentage of workload)
April 1982 – March 1983



*Chemotherapy only
†External beam only

TABLE V

Number of Treatments Given in the Department of Radiotherapy

April 1982 – March 1983

External Beam	
Superficial x-ray	1,815
Deep x-ray	2,743
Cobalt	48,556
Caesium	74
Betatron	5,854
Linear accelerators	24,365
Total	**83,407**
Inpatient treatments	16,938
Outpatient treatments	66,469
Total	**83,407**
Sealed Sources	
Intracavitary	258
Interstitial (needles, wires, seeds & grains)	57
Moulds and applicators	100
Total	**415**

TABLE VI

Services at Peripheral Clinics

April 1982 – March 1983

	New Patients Seen		*Peripheral Clinic Visits**	
Clinic	*Malignant*	*Other*	*Malignant*	*Other*
North Bay	124	7	1289	35
Owen Sound	82	3	691	24
Peterborough	27	0	1583	58
Sault Ste. Marie	51	2	775	13
Sudbury	32	0	1227	32
Timmins	32	7	1016	35
Total	**348**	**19**	**6581**	**197**

* *Including the visits when patients are first seen at peripheral clinics as well as subsequent visits for new and old patients.*

TABLE VII

Paediatric Cases Under 17 Years of Age

April 1982 – March 1983

Leukemia	40
Lymphomas:	
Hodgkin's Disease	11
Non-Hodgkin's Lymphoma	8
Bone Tumours:	
Ewing's Sarcoma	3
Sarcomas:	
Rhabdomyosarcoma	6
Other sarcomas	2
C.N.S.:	
Medulloblastoma	9
Ependymoma	4
Astrocytoma	3
Other gliomata	2
Other C.N.S. tumours	6
Neuroblastoma	12
Nephroblastoma	9
Retinoblastoma	7
Other Malignant Neoplasms	11
Benign and non-neoplastic lesions	15
Total	**148**

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LECTURES AND PAPERS

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Alison RE. *The positive side of cancer.* Collingwood and District Unit, Canadian Cancer Society. Collingwood, Ontario, October, 1982.

Alison RE. *Cancer: what's new?* Bernard Betel Centre for Creative Living. Willowdale, Ontario, March, 1983.

Alison RE. *Rehabilitation of the cancer patient.* Cancer Information for Occupational Health Nurses. Toronto, Ontario, March, 1983.

Archer MC. *Mechanisms in nitrosamine carcinogenesis.* Department of Environmental and Community Medicine, College of Medicine and Dentistry of New Jersey, Rutgers Medical School. Piscataway, New Jersey, May, 1982.

Archer MC. *Nitrosation and cancer.* Peptic Ulcer '82 – Special symposium, Canadian Association of Gastro-enterology. Toronto, Ontario, May, 1982.

Archer MC. *Carcinogenesis (chemistry).* National Cancer Institute of Canada, Course in Oncology. McMaster University. Hamilton, Ontario, June, 1982.

Archer MC. *Formation of N-nitroso compounds in vivo.* 13th International Cancer Congress. Seattle, Washington, September, 1982.

Archer MC. *Mechanisms in nitrosamine carcinogenesis.* Cross Cancer Institute, University of Alberta. Edmonton, Alberta, November, 1982.

Archer MC. *Do N-nitroso compounds play a role in human cancer causation?* Institute of Environmental Health, University of Cincinnati Medical Center. Cincinnati, Ohio, February, 1983.

Arnold L (with L Panthaki). *Cancer chemotherapy. North York General Hospital.* North York, Toronto, January, 1983.

Bean HA. *The role of radiotherapy in ovarian cancer.* Symposium, University of Massachusetts. Sturbridge Village, Massachusetts, June, 1982.

Bean HA. *The use of intraperitoneal radioactive colloids in cancer of ovary.* Symposium, University of Massachusetts. Sturbridge Village, Massuchusetts, June, 1982.

Bean HA. *Carcinoma of ovary.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, September, 1982.

Bean HA. *Carcinoma of ovary.* Radiological Society of North America. Chicago, Illinois, December, 1982.

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Bergsagel DE. *The therapy of myeloma and development of acute leukemia.* Herbert L. Orlovitz Institute, Hahnemann Medical College. Philadelphia, Pennsylvania, April, 1982.

Bergsagel DE. *Plasma cell neoplasms.* 19th Congress of the International Society of Haematology. Budapest, Hungary, August, 1982.

Bergsagel DE. *Treatment of the chronic and acute phases of plasma cell myeloma.* 19th Congress of the International Society of Haematology. Budapest, Hungary, August, 1982.

Bergsagel DE. *Assessing the response of plasma cell neoplasms to treatment.* Kaiser Foundation Hospital. San Francisco, California, September, 1982.

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Bergsagel DE. *Treating Hodgkin's disease without a policy of staging laparotomy.* Kaiser Foundation Hospital. San Francisco, California, September, 1982.

Bergsagel DE. *Is plasma cell myeloma a hemopoietic stem cell malignancy?* American Society of Hematology. Washington, D.C., December, 1982.

Bernstein A. *Erythroleukemia induction by a murine retrovirus.* Department of Microbiology and Immunology, University of Puerto Rico. San Juan, Puerto Rico, April, 1982.

Bernstein A (with A Joyner). *Gene transfer sing retrovirus vectors.* Workshop on Gene Transfer and C ncer, NCI Frederick Cancer Research Facility. Frederick, Maryland, April, 1982.

Bernstein A (with A Joyner). *Generation of retrovirus vectors by in vitro and in vivo recombination.* Carolina Conference – Gene Transfer and Gene Expression. Raleigh, North Carolina, November, 1982.

Bernstein A. *Insertion of genes into retroviruses and retroviruses into genes.* Department of Biology, McMaster University. Hamilton, Ontario, December, 1982.

Bernstein A. *Molecular and cellular biology of Friend erythroleukemia.* Harvard Medical School, Sidney Farber Cancer Institute. Boston, Massachusetts, January, 1983.

Bernstein A. *Gene transfer into hematopoietic cells with naturally occurring and in vitro constructed murine retrovirus vectors.* Department of Biochemistry, University of Calgary. Calgary, Alberta, March, 1983.

Blend R (with DF Rideout, PY Poon, S Herman and IF Majesky). *The case for nuclear magnetic resonance imaging in oncology.* 45th Annual Meeting of Canadian Association of Radiologists. Winnipeg, Manitoba, May, 1982.

Blend R. *CT scanning in colo-rectal cancer.* 22nd Clinical Conference of The Ontario Cancer Treatment and Research Foundation. Kingston, Ontario, October, 1982.

Boyd NF (with B O'Sullivan, JE Campbell, E Fishell, I Simor, G Cooke and T Germanson). *Mammographic parenchymal patterns and breast cancer risk: methodologic standards and contradictory results.* Fundamental Problems in Breast Cancer. Jasper, Alberta, September, 1982.

Boyd NF. *Body weight and prognosis in breast cancer.* Texas Club of Internists, The Westin Hotel. Toronto, Ontario, October, 1982.

Boyd NF. *Clinical epidemiology of cancer in the elderly.* Cancer in the Elderly – An Interdisciplinary Perspective. New York, New York, October, 1982.

Boyd NF (with J Sutherland and BJ Cummings). *The selection of primary therapy for patients with cancer of the rectum.* 4th Annual Meeting of the Society for Medical Decision Making. Boston, Massachusetts, October, 1982.

Boyd NF. *A study of diet and breast dysplasia.* Vanderbilt Conference on Psychobiological Aspects of Conditioned Taste Aversion and Nutritional Problems in Cancer. Nashville, Tennessee, March, 1983.

Bronskill MJ. *Current art of NMR imaging and The Ontario Cancer Institute program.* Annual Meeting of the The Ontario Cancer Treatment and Research Foundation. Kingston, Ontario, October, 1982.

Bronskill MJ. *New developments in diagnostic imaging.* Canadian Cancer Society Science Writers' Symposium. Toronto, Ontario, March, 1983.

Buick RN. *Cell biology of human ovarian cancer.* Imperial Cancer Research Foundation. London, England, August, 1982.

Buick RN. *Cell biology of human ovarian cancer.* Alberta Heritage Fund. Edmonton, Alberta, September, 1982.

Buick RN. *A stem cell hierarchy in human ovarian carcinoma.* Alberta Heritage Fund. Calgary, Alberta, September, 1982.

Buick RN. *A stem cell hierarchy in human ovarian carcinoma.* Institute for Cancer Research. Sutton, England, September, 1982.

Buick RN. *A stem cell model of tumor growth.* International Cancer Congress, Human Tumor Clonogenic Cell Symposium. Seattle, Washington, September, 1982.

Buick RN. *Stem cells in human tumors: biological and clinical implications.* University of Ottawa, Cancer Symposium. Ottawa, Ontario, September, 1982.

Buick RN. *Cell heterogeneity in ovarian cancer.* University of Arizona, Cancer Center Seminar Series. Tucson, Arizona, November, 1982.

Buick RN. *The phenotypic heterogeneity of human ovarian tumor cells in relation to cell function.* Symposium on Radio-immunoimaging. Albuquerque, New Mexico, November, 1982.

Buick RN. *An appraisal of clonogenic assays.* Oncology Rounds, McGill University. Montreal, Quebec, December, 1982.

Buick RN. *The stem cell hierarchy in human ovarian cancer.* Oncology Rounds, Montefiore Oncology Rounds, Montefiore Hospital. Montefiore, New York, March, 1983.

Bush RS. *Radiation therapy of ovarian carcinoma.* German Radiological Society. Berlin, West Germany, May, 1982.

Bush RS. *Moving strip tecnnique: indications and results.* Carcinoma of the Ovary Symposium. Dusseldorf, West Germany, June, 1982.

Bush RS. *Radiation therapy of ovarian cancer.* International Conference in the Adjuvant Therapy of Cancer. London, England, June, 1982.

Bush RS. *Advances in the management of patients with ovarian cancer.* 13th International Cancer Congress. Seattle, Washington, September, 1982.

Bush RS. a) *Cancer of the ovary: surgery, radiotherapy and chemotherapy.* b) *The compleat oncologist.* 4th Mayo Foundation Visiting Professor of Oncology. Rochester, Minnesota, September, 1982.

Bush RS. *Advances in oncology.* Association of Canadian Teaching Hospitals. Toronto, Ontario, October, 1982.

Bush RS. *Radiation therapy in ovarian carcinoma.* Piedmont Oncology Association. Asheville, North Carolina, October, 1982.

Bush RS. a) *Endpoints in the analysis of treatment* b) *Treatment of epithelial cancer of the ovary* c) *An integrated approach to non-Hodgkin's lymphoma* d) *Cervix cancer – the use of cell sensitizers* e) *Extranodal non-Hodgkin's lymphoma of the GI tract.* 35th Annual Los Angeles Midwinter Oncology Conference, Post Conference Seminar. Maui, Hawaii, February, 1983.

Bush RS. a) *Treatment of carcinoma of the ovary* b) *An analysis of prognostic factors in patients with cancer of the ovary* c) *The place of radiation therapy in patients with non-Hodgkin's lymphoma* d) *Long Term survival in gynecological malignancies.* 35th Annual Los Angeles Midwinter Oncology Conference. Los Angeles, California, February, 1983.

Chai R (with M Spino, J Thiessen and S MacLeod). *Both cloxacillin and radioisotope renal clearance are normal in cystic fibrosis.* 29th Canadian Conference on Pharmaceutical Research. Ottawa, Ontario, May, 1982.

Ciampi A (with S Hogg). *A recursive partition algorithm for the classification of survival data.* Classification Society. Montreal, Quebec, May, 1982.

Ciampi A (with R Buick, L Kates and JE Till). *A multitype Galton-Watson branding process as a model of cell differentiation.* Cell Kinetic Society. Baltimore, Maryland, March, 1983.

Ciampi A (with R Buick, L Kates and JE Till). *A multitype Galton-Watson branding process as a model of cell differentiation.* Department of Mathematics and Statistics, Queen's University. Kingston, Ontario, March, 1983.

Clark RM. *Alternatives to mastectomy – The Princess Margaret Hospital experience.* International Conference on the Use of Radiation Therapy and Conservative Surgery in the Treatment of Early Breast Carcinoma. Boston, Massachusetts, May, 1982.

Clark RM. *Conservative treatment of early primary breast cancer.* The Ontario Cancer Treatment and Reasearch Foundation, London Clinic. London, Ontario, May, 1982.

Clark RM. *Breast cancer: a twenty-two year study of the conservative approach.* Symposium on Fundamental Problems in Breast Cancer. Jasper, Alberta, September, 1982.

Clark RM. *A philosophical look at cancer.* Annual General Meeting of the Meadowvale West Branch, Canadian Cancer Society. Toronto, Ontario, September, 1982.

Clark RM. *What is the optimum treatment for early breast cancer?* Toronto Western Hospital. Toronto, Ontario, October, 1982.

Clark RM. *Primary radiotherapy for minimal breast cancer.* Kansas City Southwest Clinical Society. Kansas City, Missouri, November, 1982.

Connolly JC (with MK Gospodarowicz, JG Herman, WD Rider, PG Garrett and A Connor). *Tumour vasculature and treatment results in patients with multiple superficial bladder cancer.* American Urological Association. Kansas City, Missouri, May, 1982.

Connolly JC (with MK Gospodarowicz, JG Herman, WD Rider, PG Garrett and A Connor). *Endoscopic photography in superficial bladder cancer.* 13th International Cancer Congress. Seattle, Washington, September, 1982.

Connolly JG (with MK Gospodarowicz, JG Herman, WD Rider, PG Garrett and A Connor). *Endoscopic photography in patients with low grade (0-1) low stage (Ta) bladder cancer.* 2nd National Bladder Cancer Conference. Sarasotta, Florida, January, 1983.

Cummings BJ. *External beam radiation therapy for primary rectal cancer.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, June, 1982.

Cummings BJ. *The results of the treatment of chordoma by radiation therapy.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, June, 1982.

Cummings BJ. *The diagnosis and treatment of common cancers: colorectal cancer.* 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec, September, 1982.

Cummings BJ. *Radiation therapy alone or with chemotherapy for anal canal carcinoma.* 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec, September, 1982.

Cummings BJ. *Soft tissue sarcomas: diagnosis and management.* 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec, September, 1982.

Cummings BJ. *Local radiation therapy in the management of sarcomas of the breast.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Cummings BJ. *The role of potential methods of clinical staging: is there a role for primary radiotherapy? Panel Discussion: Carcinoma of the Colorectum.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Cummings BJ. *The role of radiation therapy for rectal carcinoma.* Clinical Conference on Colorectal Cancer of The Ontario Cancer Treatment and Research Foundation. Kingston, Ontario, October, 1982.

Cummings BJ. *The treatment of glomus tumors of the middle ear region by radiation therapy.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Cummings BJ. *Adjuvant radiation therapy for rectal carcinoma.* 3rd Annual Symposium on Colon and Rectal Surgery, Cleveland Clinic Educational Foundation. Cleveland, Ohio, November, 1982.

Cummings BJ. *The prevention of radiation injury to the intestine.* 3rd Annual Symposium of Colon and Rectal Surgery, Cleveland Clinic Educational Foundation. Cleveland, Ohio, November, 1982.

Cummings BJ. *The treatment of anal canal carcinoma using combined radiation therapy and chemotherapy.* New York University Medical Center. New York, New York, November, 1982.

Cummings BJ. *The role of radiation therapy in metastatic melanoma.* Panel Discussion: Malignant Melanoma – Current Controversies, University of Toronto. Toronto, Ontario, February, 1982.

Cummings BJ (with W Clark, A Boddie and I Quirt). *Is prophylactic lymph node dissection warranted for melanoma?* Panel Discussions: Malignant Melanoma – Current Controversies, University of Toronto. Toronto, Ontario, February, 1983.

Cummings BJ. *The place of radiation therapy in the treatment of rectal carcinoma; the treatment of primary and metastatic melanoma by radiation.* Combined Oncology Rounds, Johannesburg Hospital. Johannesburg, South Africa, March, 1983.

Cummings BJ. *The response of juvenile angiofibroma and glomus tumors to radiation; the treatment of carcinoma of the larynx.* Departments of Otolaryngology and Radiotherapy, Johannesburg Hospital. Johannesburg, South Africa, March, 1983.

Cummings BJ. *The treatment of anal carcinoma by radiation and chemotherapy.* Department of Surgery, Johannesburg Hospital. Johannesburg, South Africa, March, 1983.

Cummings BJ. *Treatment of carcinoma of the anal canal; the prevention of radiation bowel damage; radiation therapy for juvenile nasopharyngeal angiofibroma and glomus tumors; treatment of chordoma by radiation therapy; decision making in the management of rectal cancer.* Department of Radiotherapy, Hillbrow Hospital. Johannesburg, South Africa, March, 1983.

Cunningham AJ. *The use of relaxation and mental imagery with cancer patients.* Palliative Care Group, Toronto Western Hospital. Toronto, Ontario, May, 1982.

Cunningham AJ. *The possible use of mind in cancer therapy.* Ontario Medical Students Association, University of Toronto. Toronto, Ontario, September, 1982.

Cunningham AJ. *Immunology and psychology interface: an approach to self-control.* Ontario Oncology Association for Health Professionals, Clinical Conference on The Reality of Cancer. Toronto, Ontario, October, 1982.

Cunnigham AJ. *Influence of mental processes in cancer.* Conference on Role of Belief in the Healing Process, McMaster University. Hamilton, Ontario, February, 1983.

Cunningham IA (with A Fenster). *Use of a photo-diode array with an image intensifier tube for digital angiography.* 68th Scientific Assembly and Annual Meeting of the Radiological Society of North America. Chicago, Illinois, November, 1982.

Cunningham JR. *Use of computed tomography in radiotherapy planning.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, May, 1982.

Cunningham JR. *International system of units: conversion for radiotherapy.* Canadian Association of Physicists in Medicine. Kingston, Ontario, June, 1982.

Cunningham JR. *Tissue heterogeneity characterization and corrections.* American Association of Physicists in Medicine Summerschool. New Orleans, Louisiana, July, 1982.

Cunningham JR. *Computer assisted treatment planning in radiotherapy.* Invited speaker, World Congress on Medical Physics. Hamburg, Germany, September, 1982.

Cunningham JR. *Development of uses of computers in radiotherapy.* Workshop on Physical Aspects of High Energy Electron Accelerators on Radiation Therapy. Madras, India, November, 1982.

Cunningham JR. 1) *Development of uses of computers in radiotherapy* 2) *Characteristics of high energy photon and electron beams.* Workshop on Physical Aspects of High Energy Electron Accelerators on Radiation Therapy. Bombay, India, November, 1982.

Cunningham JR. 1) *Basic interactions and energy deposition for photons and electrons* 2) *Production of x-rays and electron beams for radiotherapy* 3) *Point dose computations in patients* 4) *Treatment planning: single beam* 5) *Treatment planning: combinations of beams* 6) *The use of computed thermography in radiotherapy* 7) *Compensating filters and beam shaping: clinical applications* 8) *Dose calculations in the presence of tissue inhomogeneities: pro and con* 9) *Brachytherapy: manual and computer calculations.* Lecture Series, University of Florida College of Medicine. Gainesville, Florida, February, 1983.

Curtis JE. *Bone marrow transplantation in chronic myeloid leukemia.* Bone Marrow Transplantation Symposium, 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec, September, 1982.

Dembo AJ (with TC Brown, RS Bush and JFG Sturgeon). *Prognostic significance of pathology subtype and differentiation in epithelial carcinoma of ovary.* 18th Annual Meeting of the American Society of Clinical Oncology. St. Louis, Missouri, April, 1982.

Dembo AJ. *Radiotherapy for gynecologic malignancies.* Symposium for Nurses – Cancer in Women. Ryerson Polytechnical Institute. Toronto, Ontario, May, 1982.

Dembo AJ. *The management of epithelial carcinoma of the ovary.* University of Michigan Medical School. Ann Arbor, Michigan, July, 1982.

Dembo AJ. *Simulation of treatments in radiation therapy and integration of computerized tomography on simulation.* V Simposio Anual Sobre Cancer. Bogota, Colombia, July, 1982.

Dembo AJ (with TC Brown, RS Rush and JFG Sturgeon). *Prognostic significance of pathology subtype and differentiation in epithelial carcinoma of ovary.* 5th Annual Meeting of the Society of Memorial Gynecologic Oncologists. Montreal, Quebec, September, 1982.

Dembo AJ. *Radiosensitivity of different tumor burden and abdominal radiotherapy: indications and Princess Margaret Hospital results.* Symposium on the Recent Progress in Ovarian Cancer Therapy. Padua, Italy, October, 1982.

Dembo AJ. *The Princess Margaret Hospital experience in the management of ovarian cancer and prognostic factors in ovarian cancer: application of multi-variate analysis.* Gadeski Visiting Professor to the Cross Cancer Institute. Edmonton, Alberta, November, 1982.

Dembo AJ. *Ovarian cancer: The Princess Margaret Hospital radiotherapy experience.* Gynecology Rounds, Massachusetts General Hospital. Boston, Massachusetts, December, 1982.

Dembo AJ. *External irradiation: The Princess Margaret Hospital experience and prognostic factors and their influence in the choice of postoperative therapy.* Oncology Seminar Series: Ovarian Cancer – New Approaches to the Treatment of Adolescents and Adults. Roswell Park Memorial Institute. Buffalo, New York, February, 1983.

Dembo AJ. *Postoperative abdominopelvic irradiation in epithelial ovarian cancer.* Annual Meeting of the Swiss Society of Oncology. Basel, Switzerland, March, 1983.

Dembo AJ. *The role of radiation therapy in the treatment of ovarian cancer.* Ludwig Institute for Cancer Research. Bern, Switzerland, March, 1983.

Drost DJ (with A Fenster). *A xenon ionization detector for scanned projection digital radiography.* 68th Scientific Assembly and Annual Meeting of the Radiological Society of North America. Chicago, Illinois, November, 1982.

Ege GN. *Clinical applications of lymphoscintigraphy.* Nuclear Medicine Section, Medical Society of the District of Columbia. Washington, D.C., November, 1982.

Ege GN. *Lymphoscintigraphy in oncology.* Montreal General Hospital. Montreal, Quebec, October, 1982.

Ege GN. *New diagnostic techniques: radionuclide imaging.* 22nd Clinical Conference on Colorectal Cancer. The Ontario Cancer Treatment and Research Foundation. Kingston, Ontario, October, 1982.

Ege GN. *The role of lymphoscintigraphy in oncology.* George Washington University Medical Center. Washington, D.C., November, 1982.

Ege GN. *Lymphoscintigraphy in oncology.* Georgetown University Hospital. Washington, D.C., March, 1983.

Ege GN. *Lymphoscintigraphy in the management of neoplastic disease.* Washington Hospital Center. Washington, D.C., March, 1983.

Erlichman C. *The effect of adriamycin on a human bladder cell line (MGH-U1) grown as a monolayer, as spheroids and in immune deprived mice.* American Association for Cancer Research. St. Louis, Missouri, April, 1982.

Feld R. *Herpes zoster in patients with lung cancer.* 18th Annual Meeting of the American Society of Clinical Oncologists. St. Louis, Missouri, April, 1982.

Feld R. *Sites of recurrence in resected stage I non-small cell lung cancer.* American Association of Cancer Research. St. Louis, Missouri, April, 1982.

Feld R. *Herpes zoster in patients with bronchogenic carcinoma.* 3rd World Conference on Lung Cancer. Tokyo, Japan, May, 1982.

Feld R. *Clinical trials in lung cancer across Canada.* Bristol-Myers Symposium. Toronto, Ontario, September, 1982.

Feld R. *The diagnosis and treatment of common cancers – carcinoma of the lung.* 51st Annual Meeting of the Royal College of Physicians and Surgeons. Quebec City, Quebec, September, 1982.

Feld R. *Current management of small cell carcinoma of the lung.* 14th World Congress on Diseases of the Chest. Toronto, Ontario, October, 1982.

Feld R. *Chemotherapy.* 1st Annual Northern Ontario Oncology Symposium. Sudbury, Ontario, November, 1982.

Feld R. *Treatment of lung cancer.* 1st Annual Northern Ontario Oncology Symposium. Sudbury, Ontario, November, 1982.

Fenster A (with BK Rutt and IA Cunningham). *Selective iodine imaging with lanthanum K x-rays.* 68th Scientific Assembly and Annual Meeting of the Radiological Society of North America. Chicago, Illinois, November, 1982.

Fine S. *Grand Rounds, Princess Margaret Hospital.* Toronto, Ontario, April, 1982.

Fine S. *New advances in antiemetic therapy.* Clinical Day, Etobicoke General Hospital. Toronto, Ontario, May, 1982.

Fine S. *Chemotherapy in colorectal cancer.* 22nd Annual Clinical Conference on Colorectal Cancer. Kingston, Ontario, October, 1982.

Fine S. *Cancer Screening: examining the controversies.* The Bernard Betel Centre for Creative Living. Toronto, Ontario, March, 1983.

Finnegan PM. *Oncological nursing.* In-house programme for graduate nurses at Scarborough General Hospital on behalf of Centennial College. Toronto, Ontario, April-May, 1982.

Finnegan PM. *Prevention and therapy of infections and hemorrhage.* Complications of Cancer, Ryerson Polytechnical Institute. Toronto, Ontario, June, 1982.

Finnegan PM. *Immunological section of the theory II course in critical care.* Senaca College. Toronto, Ontario, February-March, 1983.

Fitzpatrick PJ. *External irradiation in the treatment of ocular melanoma.* Workshop on Ocular Melanoma, Massachusetts General Hospital. Boston, Massachusetts, May, 1982.

Fitzpatrick PJ. *The results of radiotherapy in treating intra-ocular melanoma.* Workshop on Intraocular Melanoma. Cyclotron Unit, Harvard Medical School. Cambridge, Massachusetts, May, 1982.

Fitzpatrick PJ. *The treatment of intraocular melanoma with radioactive implants.* Workshop on Ocular Melanoma, Massachusetts General Hospital. Boston, Massachusetts, May, 1982.

Fitzpatrick PJ. *Radiotherapy of facial cancer.* 102nd Annual Meeting of the Ontario Medical Association. Toronto, Ontario, June, 1982.

Fitzpatrick PJ. *Half body irradiation.* Session Chairman, 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Fitzpatrick PJ. *Radiotherapy of facial cancer.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Fitzpatrick PJ. *Radiotherapy of skin cancer.* Refresher Course, 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Fitzpatrick PJ. *The treatment of basal and squamous cell carcinomas of the eyelids by radiotherapy.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Fitzpatrick PJ. *The Sudbury-Manitoulin Oncology Programme.* Update Cancer '82, Sudbury Oncology Day. Sudbury, Ontario, November, 1982.

Fitzpatrick PJ. *Squamous cell carcinoma of the head and neck.* Clinic Workshop on Head and Neck Cancer for The Ontario Cancer Treatment and Research Foundation of London. Alton, Ontario, February, 1983.

Fitzpatrick PJ. *Cancer.* Canadian Cancer Society, Holy Blossom Temple. Toronto, Ontario, March, 1983.

Fornasier VL. *Changing concepts of bone tumours: recent advances in pathology.* University of Toronto, Faculty of Medicine. Toronto, Ontario, April, 1982.

Fornasier VL. *Leiomyosarcoma in bone: primary or secondary?* International Skeletal Society Meeting. San Francisco, California, August, 1982.

Fornasier VL. *Fracture healing.* Post-graduate Orthopaedic Course, Toronto Western Hospital. Toronto, Ontario, September, 1982.

Fornasier VL. *Short course in metabolic degenerative disease of bone.* International Association of Pathologists. Atlanta, Georgia, March, 1983.

Fornasier VL. *Panelist: Specialty Conference Programme, International Association of Pathologists.* Atlanta, Georgia, March, 1983.

Foster Dr (with D Lee, M Arditi, MS Patterson, FS Foster and JW Hunt). *Computer simulations of B-scan images.* IEEE 1982 Ultrasonics Symposium. San Diego, California, October, 1982.

Foster FS (with M Strban). *Scanning acoustic macroscope: analysis of breast tissues.* IEEE 1982 Ultrasonics Symposium. San Diego, California, October, 1982.

Garrett PG (with WJK Simpson and M Platts). *Ependymomas: results of radiation treatment.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Gorczynski RM. *The brain, behaviour and immune responses.* Mount Sinai Hospital. Toronto, Ontario, June, 1982.

Gorczynski RM. *Learning, conditioning and immune responses: studies in mice: classical conditioning of antibody and cell-mediated immunity in mice.* Workshop on Psycho-neuroimmunology. Utrecht, The Netherlands, December, 1982.

Gorczyski RM. *Psychoneuroimmunological interactions: mechanisms – learning; exploration of possible immune system – CNS interactions in conditioned immune responses in mice.* Workshop on Psychoneuroimmunology. Utrecht, The Netherlands, December, 1982.

Gorczynski RM. *Human heredity and its social applications.* University of Toronto, Department of Zoology. Toronto, Ontario, February, 1983.

Gorczynski RM. *Maternal involvement in acquired immunological unresponsiveness.* University of Toronto, Department of Microbiology. Toronto, Ontario, March, 1983.

Gribbin MA. *Rhabdomyosarcoma of the head and neck in children.* Neuroscience Rounds, Women's College Hospital. Toronto, Ontario, May, 1982.

Gribbin MA. *Diagnosis and management of childhood cancer.* Ronald McDonald House. Toronto, Ontario, March, 1983.

Harris JW (with AF Chambers, RP Hill and V Ling). *The dynamic heterogeneity model of metastatic variations.* Cancer Invasion and Metastases Meeting. Houston, Texas, March, 1983.

Harwood AR (with FA Beale, BJ Cummings, PG Garrett, TJ Keane, DG Payne and WD Rider). *The management of advanced supraglottic carcinoma by delayed combined therapy.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Harwood AR. *Cancer of the larynx.* Oncologist Rounds, Montreal General Hospital. Montreal, Quebec, April, 1982.

Harwood AR. *Radiotherapy of cancer of the larynx.* Memorial Sloan-Kettering Cancer Center, Grand Radiotherapy Rounds. New York, New York, November, 1982.

Harwood AR. *The role of radiotherapy in cancer of the larynx and pharynx.* Academy of Medicine, Otolaryngology Section. Toronto, Ontario, November, 1982.

Harwood AR. *Advances in the staging and treatment of cancer of the rectum and anal canal.* Oncology Rounds, Nottingham General Hospital. Nottingham, England, January, 1983.

Harwood AR. *5-FU mitomycin-C and irradiation in squamous cell carcinoma.* Oncology Rounds, Netherlands Cancer Institute. Amsterdam, The Netherlands, January, 1983.

Harwood AR. *5-FU mitomycin-C for squamous cell carcinoma.* Seminar, Academic Hospital. Leuven, Belgium, January, 1983.

Harwood AR. *Management of laryngeal cancer.* Academic Hospital. Leuven, Belgium, January, 1983.

Harwood AR. *Management of laryngeal cancer.* Kanton Hospital. Basel, Switzerland, January, 1983.

Harwood AR. *Radiotherapy of laryngeal carcinoma.* Radiotherapy Rounds, Netherlands Cancer Institute. Amsterdam, The Netherlands, January, 1983.

Harwood AR. *Seminar on radiotherapy of melanoma.* Netherlands Cancer Institute. Amsterdam, The Netherlands, January, 1983.

Harwood AR. *Carcinoid tumors.* Toronto Western Oncology Rounds, Toronto Western Hospital. Toronto, Ontario, April, 1982.

Harwood AR. *Kaposi's sarcoma.* Sunnybrook Rounds, Sunnybrook Medical Centre. Toronto, Ontario, June, 1982.

Harwood AR. *Kaposi's sarcoma.* Wellesley Hospital Medical Rounds, Wellesley Hospital. Toronto, Ontario, September, 1982.

Harwood AR. *Radiotherapy of lentigo maligna and lentigo maligna melanoma.* Atlantic Dermatology Meeting, Toronto General Hospital. Toronto, Ontario, September, 1982.

Harwood AR. *Conventional fractionated radiotherapy for lentigo maligna and lentigo maligna melanoma.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Harwood AR. *The management of advanced supraglottic carcinoma.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Harwood AR. *Management of carcinoma of the larynx.* Head and Neck Rounds, Mount Sinai Hospital. Toronto, Ontario, October, 1982.

Harwood AR. *Panel: update on transglottic carcinomas.* 24th Annual Scientific Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Harwood AR. *Panel discussion: salvage surgery and the Toronto philosophy of treatment of cancer of the head and neck.* Academy of Medicine, Otolaryngology Section. Toronto, Ontario, November, 1982.

Harwood AR. *Is a wide excision necessary for malignant melanoma?* Panel discussion: Malignant melanoma - Current Controversies. Women's College Hospital. Toronto, Ontario. February, 1983.

Harwood AR. *Role of radiation therapy in primary malignant melanoma.* Panel discussion: Malignant melanoma – Current Controversies. Women's College Hospital. Toronto, Ontario. February, 1983.

Harwood AR. *Kaposi's sarcoma.* Toronto General Surgical Rounds. Toronto General Hospital. Toronto, Ontario. March, 1983.

Harwood AR. *Kaposi's sarcoma in renal transplant patients.* Epidemic Kaposi's Sarcoma. New York University. New York, New York. March, 1983.

Harwood AR. *Management of advanced supraglottic cancer by irradiation with surgery in reserve.* American Society of Head and Neck Surgery. Palm Springs, California. March, 1983.

Harwood AR (with FA Beale, BJ Cummings, PG Garrett, TJ Keane, DG Payne and WD Rider). *The management of advanced supraglottic cancer by irradiation with surgery in reserve.* The American Society of Head and Neck Surgery. Palm Springs, Florida. March, 1983.

Hasselback R. *Dialogue – Dying with Dignity.* Metro Reference Library. Toronto, Ontario. April, 1982.

Hasselback R. *An overview of cancer.* In-Service Education Program for Nurses, Women's College Hospital. Toronto, Ontario. April, 1982.

Hasselback R. *Statement on macrobiotic diet.* Global News. Toronto, Ontario. August, 1982.

Hasselback R. *Cancer forum.* Canadian Cancer Society, Mount Forest Unit. Mount Forest, Ontario. October, 1982.

Hasselback R. *Screening for disease with particular reference to cancer.* Canadian Cancer Society, Beaches Riverdale Unit Toronto, Ontario. October, 1982.

Hasselback R. *Alternative methods of cancer treatment.* Canadian Cancer Society, Toronto Unit, CanSurmount Volunteers. Toronto, Ontario. November, 1982.

Hasselback R. *The nature of cancer.* Canadian Cancer Society Toronto Unit Volunteers – A Little of What You Always Wanted to Know About Cancer, But Haven't Had the Opportunity to Ask. Toronto, Ontario. November, 1982.

Hasselback R. *Nature, cause and prevention of cancer.* Board of Education Teachers. Toronto, Ontario. December, 1982.

Hasselback R. *Clippings in perspective.* Campaign Conference. Ontario Division, Canadian Cancer Society. Toronto, Ontario. January, 1983.

Hasselback R. *Clippings in perspective.* Volunteer Mini Conference. Essex County District, Canadian Cancer Society. Windsor, Ontario. February, 1983.

Hasselback R. *Recent advances in our understanding of cancer.* CBC Radio. Windsor, Ontario. February, 1983.

Hasselback R. *Unorthodox treatment of cancer.* North York General Hospital Nurses. North York, Ontario. February, 1983.

Hasselback R. *Carcinogens in the workplace.* Cancer Information Seminar. Occupational Nurses. Toronto, Ontario. March, 1983.

Hasselback R. *Scarborough Cable TV Phone In Show on Cancer.* Scarborough, Ontario. March, 1983.

Henkelman RM. *NMR imaging: the Canadian response.* Canada France Health Technology. Toronto, Ontario. March, 1982.

Henkelman RM. *NMR imaging: a promising new diagnostic modality?* Neurosciences Seminar. Queen's University. Kingston, Ontario. May, 1982.

Henkelman RM. *Diagnostic imaging research.* National Cancer Institute Course. Toronto, Ontario. June, 1982.

Henkelman RM. *NMR imaging at the OCI.* The Ontario Cancer Treatment and Research Foundation Board. Toronto, Ontario. October, 1982.

Henkelman RM. *A new method for inhomogeneity correction.* The Ontario Cancer Treatment and Research Foundation Conference, Physicists Meeting. Kingston, Ontario. October, 1982.

Henkelman RM. *New technologies in diagnostic imaging.* Association of Canadian Teaching Hospitals. Toronto, Ontario. October, 1982.

Henkelman RM. *Nuclear magnetic resonance imaging: what promise does it hold for medical diagnosis?* 6th Annual Meeting of the Eastern Great Lakes Head and Neck Oncology Association. Buffalo, New York. November, 1982.

Henkelman RM. *NMR imaging: a new window into the body.* Physics Colloquium. University of Waterloo. Waterloo, Ontario. January, 1983.

Henkelman RM. *NMR imaging: a new window into the body.* McMaster University. Hamilton, Ontario. March, 1983.

Henkelman RM. *Slicing the human salami.* The Ontario Science Centre. Toronto, Ontario. March, 1983.

Herman JG. *Cancer and radiotherapy.* Canadian Cancer Society Meeting Coping with Cancer. Toronto, Ontario. April, 1982.

Herman JG. *Cancer of the testis.* Radiation Society of Georgia. Atlanta, Georgia. April, 1982.

Herman JG (with PG Garrett, MK Gospodarowicz, NV Hawkins and WD Rider). *Testicular seminomas.* Canadian Oncology Society. Montreal, Quebec. September, 1982.

Herman JG (with PG Garrett, MK Gospodarowicz, NV Hawkins and WD Rider). *Testicular seminoma.* International Congress of Urology. San Francisco, California. September, 1982.

Herman JG (with PG Garrett, MK Gospodarowicz, NV Hawkins and WD Rider). *Testicular seminoma.* International Urological Association. San Francisco, California. September, 1982.

Herman JG (with PG Garrett, MK Gospodarowicz and WD Rider). *Testicular seminoma.* 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec. September, 1982.

Herman S (with DF Rideout, PY Poon, IF Majesky and R Blend). *The case for nuclear magnetic resonance imaging in oncology.* 45th Annual Meeting of Canadian Association of Radiologists. Winnipeg, Manitoba. May, 1982.

Hill RP. *Response of mouse lung to irradiation at different dose rates.* 31st Annual Meeting of the Radiation Research Society. Salt Lake City, Utah. April, 1982.

Hill RP. *Radioprotection of a mouse tumor by WR2721 when combined with single and fractionated radiation treatments.* Conference on Radioprotectors and Anticarcinogens. Gaithersburg, Maryland. June, 1982.

Hill RP. *Radioprotection of a mouse tumor by WR2721 (NSC-296961) when combined with single fractionated radiation treatments.* 31st Annual Meeting of the Radiation Research Society. San Antonio, Texas. March, 1983.

Hunt JW. *Hyperthermia: can heat be delivered to tissues as needed?* The Gray Laboratory. Silver Jubilee Symposium. Mount Vernon Hospital. Middlesex, England. May, 1982.

Hunt JW. *High resolution diagnostic ultrasound and hyperthermia.* Hammersmith Hospital. London, England. June, 1982.

Hunt JW (with D Lee, B Barker and FS Foster). *Experimental and theoretical analysis of artifacts observed in small ancchoic volumes of scattering phantoms.* 3rd Meeting of the World Federation for Ultrasound in Medicine and Biology. Brighton, England. July, 1982.

Hunt JW. *Deep heating techniques designed for hyperthermia treatment.* 13th International Cancer Congress. Seattle, Washington. September, 1982.

Hunt JW (with RP Hill and A Worthington). *High powered ultrasound sources using conical geometries used for hyperthermia studies.* 31st Annual Meeting of the Radiation Research Society. San Antonio, Texas. March, 1983.

Japp B. *Individualized Ir-192 wire moulds for treatment of large accessible malignant melanomas of the choroid.* 24th Annual Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida. October, 1982.

Jewett MAS (with RH Comisarow, JF Sturgeon and JG Herman). *Management of retroperitoneal metastatic non seminomatous testis tumour.* American Urological Association. Kansas City, Missouri. May, 1982.

Joyner A (with A Bernstein). *Gene transfer via retrovirus vectors.* Department of Microbiology and Immunology. University of California. San Francisco, California. September 1982.

Joyner A (with A Bernstein). *Retrovirus mediated gene transduction.* Department of Human Genetics. Howard Hughes Medical Institute. Houston, Texas. October, 1982.

Joyner A (with A Bernstein). *Gene transfer via retrovirus vectors.* Canadian Society for Cell Biology. Eastern Winter Workshop – Current Application of Recombinant DNA Technology. Scarborough College, University of Toronto. Toronto, Ontario. February, 1983.

Llewellyn-Thomas H (with H Sutherland, A Ciampi, A Harwood, T Keane and NF Boyd). *Linear analogue self assessment of voice quality in laryngeal cancer.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba. June, 1982.

Llewellyn-Thomas H (with H Sutherland, A Ciampi, J Etezadi-Amoli, NF Boyd and JE Till). *The assessment of values in laryngeal cancer: reliability of measurement methods.* 4th Annual Meeting of the Society for Medical Decision Making. Boston, Massachusetts. October, 1982.

Ling V. *DNA mediated transfer of multi-drug resistance and expression of P glycoprotein.* Gene Transfer and Cancer Workshop. National Institutes of Health. Frederick, Maryland. April, 1982.

Ling V. *Genetics of multidrug resistance.* ICN-UCLA Meeting on Rational Chemotherapy. Keystone, Colorado. April, 1982.

Ling V. *Genetic basis of drug resistance.* Board of Scientific Counsellors Meeting. National Cancer Institute, Division of Cancer Treatment. Bethesda, Maryland. June, 1982.

Ling V (with EM Elliott). *Cloning of α-tubulin genes from a CHO cell mutant.* Symposium on Cytoskeleton. 25th Annual Meeting of the Canadian Frederation of Biological Societies. Edmonton, Alberta. June, 1982.

Ling V (with J Harris). *High rates of generation of metastatic variation: implications for studies of metastasis.* Workshop on Metastasis, Roswell Park Memorial Institute. Buffalo, New York. June, 1982.

Ling V. *Multi-drug resistance.* Gordon Conference – Chemotherapy of Experimental and Clinical Cancer, Colby-Sawyer College. New London, New Hampshire. July, 1982.

Ling V. *Structural alteration associated with colchicine resistance.* Federation of European Biochemical Societies. Summer Research Conference. Somatic Cell Genetics. Vermont Academy. Saxon's River, Vermont. July, 1982.

Ling V. *Dynamic heterogeneity of metastatic variation.* Department of Microbiology and Immunology. University of Western Ontario. London, Ontario. January, 1983.

Ling V. *The dynamic heterogeneity model of metastatic variation.* Cancer Biology Seminar. National Cancer Institute, Frederick Cancer Research Facility. Frederick, Maryland. January, 1983.

Ling V. *Multiple drug resistance in tumor cells and P glycoprotein.* Staff Conference Series. Roswell Park Memorial Institute. Buffalo, New York. March, 1983.

McCulloch EA. *Stem cells in normal and leukemia hemopoiesis.* Lecture, Visiting Professor, Medical Research Council. Department of Medicine, University of Ottawa. Ottawa, Ontario. February, 1982.

McCulloch EA. *Progenitors and differentiation programmes in normal and malignant hemopoiesis.* Annual Meeting of the British Society for Haematology. Brighton, England. April, 1982.

McCulloch EA. *The differentiation programs of leukemic blast cells.* International Symposium on Leukemia Research. Memphis, Tennessee. May, 1982.

McCulloch EA. *Cellular lineages in normal and leukemic hemopoiesis.* 3rd Conference on Hemoglobin Switching. Rosairo, Orcas Island, Washington. September, 1982.

McCulloch EA. *Stem cells in normal and leukemic hemopoiesis.* 13th International Cancer Congress. Seattle, Washington. September, 1982.

McCulloch EA. *Stem cells in normal and leukemic hemopoiesis.* Henry M. Stratton Lecture. 24th Annual Meeting of the American Society of Hematology. Washington, D.C., December, 1982.

McCulloch EA. *Normal and malignant hemopoietic clones in man.* 22nd Midwinter Conference of Immunologists. Asilomar Conference Grounds. Pacific Grove, California. January, 1983.

Mak T. *Nucleotide sequences of murine retrovirus LTRs.* Workshop on Gene Transfer and Cancer. National Cancer Institute, Frederick Research Facility. Frederick, Maryland. April, 1982.

Mak T. *Program of human malignant T-lymphoblast differentiation.* National Cancer Institute. Bethesda, Maryland. April, 1982.

Mak T. *Host control of the type of leukemia induced by murine helper independent leukemia virus.* Cold Spring Harbor Symposium. Cold Spring Harbor, New York. May, 1982.

Mak T. *A host gene in the control of rate of proliferation of a late erythroid cell.* Cold Spring Harbor Symposium. Cold Spring Harbor, New York. May, 1982.

Mak T. *Programs of malignant T-lymphoblast differentiation.* Gordon Conference on Chemotherapy. Colby-Sawyer College. New London, New Hampshire. July, 1982.

Mak T. *Nucleotide sequence analysis of the Friend leukemia virus genome.* Southern Ontario Molecular and Cell Biology Meeting. Hamilton, Ontario. November, 1982.

Mak T. *Six distinct classes of Friend erythroleukemia cells.* 24th Annual Meeting of the American Society of Hematology. Washington, D.C., December, 1982.

Mak T. *Host and viral genes of Friend leukemia.* National Institutes of Health. Bethesda, Maryland. February, 1983.

Mak T. *Host and viral genes of Friend leukemia. Department of Biology. McMaster University. Hamilton, Ontario. March, 1983.*

Mak T. *Host and viral genes of Friend leukemia.* ICN-UCLA Meeting on Hemopoiesis. Steamboat Spring, Colorado. March, 1983.

Mak T. *Host and viral genes of Friend leukemia.* Massachusetts Institute of Technology, Cancer Center. Cambridge, Massachusetts. March, 1983.

Messner HA. *Bone marrow transplantation for chronic granulocytic leukemia.* Meeting of the Chicago Blood Club. Chicago, Illinois. May, 1982.

Messner HA (with B Lim, N Jamal and T Takahashi). *Lymphoid cells in multilineage colonies.* The Alfred Benzon Symposium No. 18. Copenhagen, Denmark. June, 1982.

Messner HA. *Review of bone marrow transplantation in Canada.* 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec. September, 1982.

Messner HA. *Analysis of hemopoietic progenitors in normal hemopoiesis and hemopoietic malignancies.* Seminar, Ontario Veterinary College. Guelph, Ontario. October, 1982.

Messner HA. *Cell cultures of hemopoietic stem cells.* Meeting of the Lakes Regional Group. Rochester, New York. October, 1982.

Messner HA. *The origin, proliferation, and differentiation of leukemic blast cell from patients which acute leukemia.* 24th Annual Meeting of the American Society of Hematology. Washington, D.C., December, 1982.

Messner HA. *Bone marrow transplantation in chronic myelogenous leukemia.* UCLA Symposia on Molecular and Cellular Biology. Park City, Utah. February, 1983.

Messner HA. *Bone marrow transplantation in Canada.* Meeting – Clinical Experiences with Organ Transplants and Cyclosporine in Canada and World-wide. Ottawa, Ontario, March, 1983.

Messner HA. *Pluripotent hemopoietic stem cells in normal hemopoiesis and hemopoietic malignancies.* Joint Center for Radiation Therapy Seminar. Boston, Massachusetts. March, 1983.

Miller RG. *Development of T-cells in T-cell colonies.* Institute for Cancer Research. Philadelphia, Pennsylvania, April, 1982.

Miller RG. *Development of T-cells in T-cell colonies.* Laboratory of Immunology, National Institutes of Health. Bethesda, Maryland, April, 1982.

Miller RG. *Veto cells: a novel system for self, non-self discrimination.* Department of Pathology, Yale University. New Haven, Connecticut, April, 1982.

Miller RG. *T-cell colonies: a model system for studying T-cell differentiation.* Immunology Research Group, University of Minnesota. Minneapolis, Minnesota, May, 1982.

Miller RG. *Flow cytometry.* Ontario Society of Medical Technologists. Hamilton, Ontario, September, 1982.

Miller RG. *In vitro systems for studying T-cell differentiation.* Max-Planck-Institut fur Biologie. Tübingen, West Germany, October, 1982.

Miller RG. *T-cell colonies as a model system for studying T-cell differentiation.* 1st International Workshop on T-Cell Colony Growth in Semi-solid Media. Poitiers, France, October, 1982.

Miller RG. *Use of Hoechst 33342 dye to measure membrane permeability.* International Symposium on Biological Dosimetry - Cytometric Approaches to Mammalian Systems. Munich, West Germany, October, 1982.

Miller RG. *In vitro systems for studying T-cell differentiation.* Department of Microbiology and Immunology, University of Western Ontario. London, Ontario, December, 1982.

Minden M. *Human cancer genes.* Haematology Staff, Residents and Technicians, Hospital for Sick Children. Toronto, Ontario, December, 1982.

Minden M. *Molecular approaches to leukemia.* Haematology Residents, St. Michael's Hospital. Toronto, Ontario, December, 1982.

Mitchell SL. *Gastrointestinal complications of cancer: nutritional problems.* Workshop for RNs, RNAs and Allied Health Professionals in the Community in Education and in Health Care Institutions, Ryerson Polytechnical Institute. Toronto, Ontario, June, 1982.

Mowat M (with A Bernstein). *Molecular genetic approaches to the study of Friend virus induced leukemia.* Division of Histology, University of Toronto. Toronto, Ontario, November, 1982.

O'Sullivan B (with NF Boyd, JE Campbell, E Fishell, I Simor, G Cooke and T Germanson). *Mammographic signs as risk factors for breast cancer.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, June, 1982.

Ottensmeyer FP. *Quantification in very high resolution elemental maps of biological specimens by electron energy loss imaging.* Symposium on Energy Loss Spectroscopy. 9th Annual Meeting of the Microscopical Society of Canada. Edmonton, Alberta, June, 1982.

Ottensmeyer FP. *Quantitative spectroscopic mapping of atomic elements in micro-anatomical surveys.* Symposium in Biophysics and Radiobiology. Canadian Association of Physicists, Congress 1982. Kingston, Ontatio, June, 1982.

Ottensmeyer FP. *Quantitative calcium maps in cartilage and exoskeleton at very high spatial resolution with electron spectroscopic imaging.* Symposium on Present and Future of Electron Pulse Microanalysis in Biology. Joint Annual Meeting of the American Histochemical Society and the Japanese Society of Histochemistry and Cytochemistry. Vancouver, British Columbia, July, 1982.

Ottensmeyer FP. *Quantification in elemental distributions of light atoms by EEL image analysis in biological sections.* Symposium on Microprobe Analysis in Biology. Joint Annual Meeting of the Electron Microscopy Society of America and the Microprobe Analysis Society. Washington, D.C., August, 1982.

Ottensmeyer FP. *Electron energy loss imaging: nano analysis at 5A resolution of phosphorus, silver . . . in biological and materials science.* Chemistry Division of the National Research Council. Ottawa, Ontario, October, 1982.

Ottensmeyer FP. *Mapping of atomic elements at very high resolution in cartilage, Golgi, ribosomes and chromatin.* Department of Pathology, University of Laval. Quebec City, Quebec, November, 1982.

Ottensmeyer FP. *Anwendungen der elektronenenergieverlustspektroskopie.* Carl Zeiss Ltd. Oberkochen, West Germany, January, 1983.

Ottensmeyer FP. *Atomic elemental mapping at very high resolution in chromatin, ribosomes, Golgi and cartilage.* College of Physicians and Surgeons, Columbia University, Cancer Center, Department of Pathology. New York, New York, January, 1983.

Ottensmeyer FP. *Elementarverteilungen mit hoher Aufloesung: Golgi apperat, chromatin und ribosom partikel.* Max-Planck-Gesellschaft fuer Molekular Genetik. Berlin, West Germany, January, 1983.

Ottensmeyer FP. *Electron energy loss analysis and imaging at high spatial resolutions in materials science and biology.* University of Western Ontario, Department of Physics. London, Ontario, March, 1983.

Ottensmeyer FP. *Structural and chemical analysis with molecular resolution: electron spectroscopic imaging – a very new development in electron microscopy.* Canadian Cancer Society Science Writers Symposium. Toronto, Ontario, March, 1983.

Panthaki L. *Participation in a breast self-examination clinic.* Women's College Hospital. Toronto, Ontario, October, 1982.

Panthaki L. *Recruitment and retention.* Toronto Health Educators Association, Queen Elizabeth Hospital. Toronto, Ontario, January, 1983.

Panthaki L. *The nurse and public education in cancer.* Occupational Health Nurses Seminar, The Princess Margaret Hospital. Toronto, Ontario, March, 1983.

Patterson MS (with FS Foster and JW Hunt) *High resolution ultrasound imaging with conical transducers.* Canadian Association of Physicists Conference. Kingston, Ontario, June, 1982.

Patterson MS (with JW Hunt and FS Foster). *Medical imaging with conical transducers.* 12th International Symposium on Acoustical Imaging. London, England, July, 1982.

Payne DG. *Irradiation of choroidal malignant melanoma: The Toronto experience.* Kingston, Ontario, May, 1982.

Payne DG. *Symptoms in tumours of eye and orbit.* Kingston, Ontario, May, 1982.

Payne DG. *Oligodendrogliomas: review of 49 cases.* 24th Annual Scientific Meeting of the Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Phillips RA. *Modifying the radiosensitivity of retinoblastoma tumors.* Annual Meeting of the American Association for Cancer Research. St. Louis, Missouri, April, 1982.

Phillips RA. *Differentiative potential of hemopoietic stem cells.* Annual Meeting of the Canadian Federation of Biological Societies. Edmonton, Alberta, June, 1982.

Phillips RA. *Genetics of Cancer.* 3rd Course in Oncology, McMaster University. Hamilton, Ontario, June, 1982.

Phillips RA. *Early stages of B-cell differentiation.* Symposium on B-Lymphocyte Differentiation. Basel, Switzerland, October, 1982.

Phillips RA. *In vitro analysis of myeloid and lymphoid stem cells.* Swiss Institute for Experimental Cancer Research. Epalinges, Switzerland, October, 1982.

Phillips RA. *Non-malignant retinal manifestations of the retinoblastoma gene.* 2nd International Symposium on Retinoblastoma. San Francisco, California, October, 1982.

Phillips RA. *Variations in self-renewal and differentiation in different subpopulations of hemopoietic stem cells.* Ulm University. Ulm, Germany, October, 1982.

Phillips RA. *Genetic approaches to the study of hemopoietic stem cells.* University of British Columbia. Vancouver, British Columbia, November, 1982.

Phillips RA. *Clonal studies of lymphoid and myeloid stem cells.* Jefferson Medical College. Philadelphia, Pennsylvania, January, 1983.

Phillips RA. *Chairman. Session on stem cells.* Workshop on Mechanisms of B-cell Neoplasia. Basel, Switzerland, March, 1983.

Poon PY. *Computed tomography in recurrent rectal carcinoma.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, May, 1982.

Poon PY. *Scanning for therapy and its application in carcinoma of cervix and a joint diagnostic and therapeutic symposium of computed tomography scanning and radiotherapy planning .* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, May, 1982.

Poon PY (with IF Majesky, RP Wallace and DL Georgas). *Radiotherapy treatment and planning computed tomography of pelvis in uterine cervical carcinoma.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, May, 1982.

Poon PY (with DF Rideout, R Blend, S Herman and IF Majesky). *The case for nuclear magnetic resonance imaging in oncology.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, May, 1982.

Pringle JF. *Cancer of the endometrium.* Residents Journal Club. Toronto, Ontario, April, 1982.

Pringle JF. *Management of bronchogenic carcinoma: use of radiation.* Ryerson Polytechnical Institute, Nursing Programme. Toronto, Ontario, June, 1982.

Pringle JF. *Role of radiotherapy in management of oesophageal carcinoma.* World Congress of Chest Physicians. Toronto, Ontario, October, 1982.

Prudo SM. *Nutrition and cancer.* OCI/PMH Radiotherapy Radiographers Postgraduate Program. Toronto, Ontario, April, 1982.

Prudo SM. *Topics in nutrition: oncology – 1982.* Conference of the Ontario Branch of the Canadian Society of Hospital Pharmacists. Toronto, Ontario, May, 1982.

Quirt IC. *Hemolytic anemias.* Undergraduate Lecture, 3rd Year Course in Hematology, University of Toronto. Toronto, Ontario, April, 1982.

Quirt IC (with P Taranavikrai, A Siu, P Poffenbarger, B Cummings and A Harwood). *Non-suppressible insulin-like protein as a tumor marker for patients with soft tissue sarcoma.* 18th Annual Meeting of the American Society of Clinical Oncology. St. Louis, Missouri, April, 1982.

Quirt IC. *Soft tissue sarcomas: chemotherapy.* Orthopedic Surgery Symposium on Soft Tissue Sarcomas: Diagnosis and Management. 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec, September, 1982.

Quirt IC. *Non-Hodgkin's lymphoma.* Oncology Section, Meeting of the Texas Club of Internists. Toronto, Ontario, October, 1982.

Quirt IC. *The non-surgical treatment of malignant melanoma.* Oncology Unit Rounds, Toronto General Hospital. Toronto, Ontario, October, 1982.

Quirt IC. *Tumor markers in patients with soft tissue sarcoma.* Meeting of the Great Lakes Regional Oncology Group. Rochester, New York, October, 1982.

Quirt IC. *An introduction to hematology.* Undergraduate Lecture, 3rd Year Course in Hematology, University of Toronto. Toronto, Ontario, November, 1982.

Quirt IC. *The chronic myeloproliferative disorders.* Refresher Course, Polish Immigrant Physicians. Toronto, Ontario, February, 1983.

Quirt IC. a) *The immunotherapy of malignant melanoma* b) *Pregnancy and oral contraceptives in malignant melanoma.* Panel Discussion: Malignant Melanoma – Current Controversies, University of Toronto Symposium. Toronto, Ontario, February, 1983.

Quirt IC. *The lymphoproliferative disorders.* Refresher Course, Polish Immigrant Physicians. Toronto, Ontario, February, 1983.

Quirt IC. *Surgical management of melanoma in Canada.* Panel Discussion: Malignant Melanoma – Current Controversies, University of Toronto Symposium. Toronto, Ontario, February, 1983.

Quirt IC. *Hemolytic anemia.* Undergraduate Lecture, 3rd Year Course in Hematology, University of Toronto. Toronto, Ontario, March, 1983.

Quirt IC. *Monoclonal Gammopathies.* Course on Advanced Hematology, Toronto Institute of Medical Technology. Toronto, Ontario, March, 1983.

Rauth AM. *Experimental studies and clinical trials of hypoxic cell radiosensitizers.* Tom Baker Cancer Centre. Calgary, Alberta, November, 1982.

Rauth AM. *Experimental studies and clinical trials of hypoxic cell radiosensitizers.* W.W. Cross Cancer Hospital. Edmonton, Alberta, November, 1982.

Rauth AM. *Hypoxic cell radiosensitizers: nitroreduction and the role of oxygen.* W.W. Cross Cancer Hospital. Edmonton, Alberta, November, 1982.

Rauth AM (with R Battistella, M Yoshimura and R Marshall). *The oxygen dependence of the radiolytic reduction of misonidazole and metroindazole.* 31st Annual Meeting of the Radiation Research Society. San Antonio, Texas, March, 1983.

Rider WD. *The roles of surgery, radiation and chemotherapy in the management of urological and bowel cancer.* Saint John Regional Hospital. Saint John, New Brunswick, May, 1982.

Rider WD. *Cancer of the rectum.* Mid-Atlantic Society of Radiation Oncologists. Richmond, Virginia, November, 1982.

Rider WD. *Radiotherapy: what is it?* Equipment, delivery, toxicity, complications; rationale and mechanisms of action. Sudbury-Manitoulin Clinical Day, Cancer Update. Sudbury, Ontario, November, 1982.

Rider WD. *Princess Margaret Hospital philosophy of radiotherapy.* Visiting Professor, University of Puerto Rico. San Juan, Puerto Rico, February, 1983.

Rideout DF. *Benefits and risks of diagnostic radiology.* Refresher course, University of Toronto – Diagnostic Radiology Quality Assurance. Toronto, Ontario, October, 1982.

Selby PJ (with JE Campbell, J Etezadi-Amoli and NF Boyd). *The measurement of quality of life in patients with breast cancer.* Fundamental Problems in Breast Cancer. Jasper, Alberta, September, 1982.

Selby PJ (with J Campbell, J Etezadi-Amoli and NF Boyd). *The psychometric properties of a measurement instrument for the quality of life of patients with breast cancer.* Canadian Society for Clinical Investigation. Quebec City, Quebec, September, 1982.

Silberfeld M. *Care of the caregivers.* School of Radiotherapy, The Princess Margaret Hospital. Toronto, Ontario, September, 1982.

Silberfeld M. *Risk-taking and suicide.* Conference, Toronto East General Hospital. Toronto, Ontario, December, 1982.

Silberfeld M. *Hope: an aspect of consultation and liaison.* Ontario Psychiatric Association. Toronto, Ontario, January, 1983.

Simpson WJ. *The response of medullary thyroid cancer to external radiation.* Asia and Oceania Thyroid Association. Toyko, Japan, August, 1982.

Simpson WJ. *External radiation in the management of medullary thyroid carcinoma.* European Thyroid Association. Brussels, Belgium, September, 1982.

Simpson WJ. *14th World Congress on Diseases of the Chest.* American College of Chest Physicians and International Academy of Chest Physicians and Surgeons. Toronto, Ontario, October, 1982.

Sturgeon JFG (with S Fine, MK Gospodarowicz, AJ Dembo, HA Bean, RS Bush, FA Beale, JF Pringle, GM Thomas and JG Herman). *A randomized trial of Melphalan alone vs. combination chemotherapy in advanced ovarian cancer.* Annual Meeting of the American Society of Clinical Oncology. St. Louis, Missouri, April, 1982.

Sturgeon JFG (with S Fine, MK Gospodarowicz, AJ Dembo, HA Bean, RS Bush, FA Beale, JF Pringle, GM Thomas and JG Herman). *A randomized trial of Melphalan alone vs. combination of chemotherapy in advanced ovarian cancer.* 51st Annual Meeting of the Royal College of Physicians and Surgeons of Canada. Quebec City, Quebec, September, 1982.

Sturgeon JFG. *Testicular tumours – The Toronto experience.* Bayview Cancer Clinic. Toronto, Ontario, October, 1982.

Sturgeon JFG. *Treatment of testicular cancer.* Texas Club of Internists Clinical Meeting. Toronto, Ontario, October, 1982.

Sturgeon JFG. *Cancer: no easy solutions.* Toronto Arts Production Forum, St. Lawrence Centre. Toronto, Ontario, November, 1982.

Sturgeon JFG. *Chemotherapy in gynaecological cancer.* Mount Sinai Hospital. Toronto, Ontario, January, 1983.

Sturgeon JFG. *The management of non-seminomatous testicular tumours.* Oncology Rounds, Montreal General Hospital. Montreal, Quebec, January, 1983.

Tannock IF. Chairman and invited speaker. *Workshop on Clonal Assays.* 2nd National Bladder Cancer Conference. Sarasota, Florida, January, 1983.

Taylor WB (with JW Hunt and FS Foster). *Analysis of a novel wide dynamic range transceiver for zone imaging.* World Federation for Ultrasound in Medicine and Biology. Brighton, England, July, 1982.

Thomas GM. *Optimal treatment of stage II pure seminoma with bulky abdominal disease.* 18th Annual Meeting of the American Society of Clinical Oncology. St. Louis, Missouri, April, 1982.

Thomas GM. *A phase I clinical and pharmacological study of misonidazole.* Annual Meeting of the American Association for Cancer Research. St. Louis, Missouri, April, 1982.

Thomas GM. *Hypoxic cell radiation sensitizers.* Bi-annual Meeting of the National Cancer Institute of Canada. Saskatoon, Saskatchewan, May, 1982.

Thomas GM. *Clinical applications of radiation sensitizers and protectors.* V Simposio Anual Sobre Cancer. Bogota, Columbia, July, 1982.

Thomas GM. *Combined modality therapy for carcinoma of the anal canal.* V Simposio Anual Sobre Cancer. Bogota, Columbia, July, 1982.

Thomas GM. *Hypoxic cell radiation sensitizers and protectors: basic science aspects.* V Simposio Anual Sobre Cancer. Bogota, Colombia, July, 1982.

Thomas GM. *Multimodality treatment of cervical and anal carcinoma.* Annual Meeting of the Florida Society of Clinical Oncology. Tampa, Florida, November, 1982.

Thomas GM. *Radiotherapy in the management of testicular carcinoma.* 18th Annual Meeting of the Society of Clinical Oncology. Tampa, Florida, November, 1982.

Thomas GM. *Hypoxic cell radiation sensitizers in carcinoma of the cervix.* Gynaecology Rounds, Saint John Regional Hospital. Saint John, New Brunswick, February, 1983.

Thomas GM. *Carcinoma of the anal canal: results of treatment with radiation, mitomycin and 5-FU.* Current Approaches to Radiation Oncology, Biology and Physics, University of California. San Francisco, California, March, 1983.

Thomas GM. *Optimal therapy for stage II seminoma.* Current Approaches to Radiation Oncology, Biology and Physics, University of California. San Francisco, California, March, 1983.

Thomas GM. *Pilot study of radiation and chemotherapy in high risk cancer of the cervix.* Current Approaches to Radiation Oncology, Biology and Physics, University of California. San Francisco, California, March, 1983.

Till JE. *Biology of cancer.* 3rd Course in Oncology, McMaster University. Hamilton, Ontario, June, 1982.

Till JE. *Cancer research: a personal view.* Graduate Department of Forestry, University of Toronto. Toronto, Ontario, November, 1982.

Till JE. *Speaker and panelist.* Public forum on cancer: no easy solutions. Toronto, Ontario, November, 1982.

Till JE. *Outcome quality of life: measurement of multiple components of quality of life.* American College of Radiology Commission on Cancer Research Plan Meeting. Philadelphia, Pennsylvania, February, 1983.

Till JE. *Regulation of hemopoietic stem cells.* Meeting of the Italian Hematology Society. Milan, Italy, March, 1983.

Trimble WS (with MJ Shulman and N Hozumi). *Molecular characterization of immunoglobulin gene expression mutants.* Ribosome Workshop, Medical Research Council. St. John's, Newfoundland, July, 1982.

Van Dyk J. *Computed tomography in radiotherapy: lung studies.* 45th Annual Meeting of the Canadian Association of Radiologists. Winnipeg, Manitoba, May, 1982.

Van Dyk J. *Whole and partial body radiotherapy.* American Association of Physicists in Medicine Summerschool. New Orleans, Louisiana, July, 1982.

Van Dyk J. *Magna field irradiations: physical considerations.* Children's Cancer Study Group Symposium, 24th Annual Meeting of the American Society of Therapeutic Radiologists. Orlando, Florida, October, 1982.

Van Dyk J. *Computed thermography for radiotherapy planning.* Meeting of the Ontario Society of Radiotherapy Technologists, Western Section. London, Ontario, November, 1982.

Yaffe MJ (with PC Johns). *Scattered radiation in diagnostic radiology.* Society of Photographic and Scientific Engineers Meeting. Rochester, New York, September, 1982.

Yaffe MJ. *Monitoring of x-ray generators.* University of Toronto, Department of Radiology/American College of Radiology, Quality Assurance Course. Toronto, Ontario, October, 1982.

In addition to their publications, lectures and papers, the Institute's medical and scientific staff make a number of contributions to university, provincial, national and international communities. They serve on many boards and grants panels, and participate in a large number of committees. The extent of such contributions during the past year is suggested by the following table:

Community	Number of Boards, Panels and Committees on which staff served
University	71
Provincial	27
National	53
International	38

AWARDS AND HONOURS

Gannon M. *Ortho Award.* Ortho Pharmaceutical Ltd. and the Canadian Society of Hospital Pharmacists, February, 1983.

Hozumi N. *The David Pressman Memorial Award for 1983.*

McCulloch EA. *Henry M. Stratton Lecture.* The American Society of Hematology. Washington, D.C., December, 1982.

McCulloch EA. *University Professor,* University of Toronto. Appointed November, 1982.

Minden MD. *1982 Scholar.* Leukemia Society of America.

ACKNOWLEDGEMENTS

The operations of The Princess Margaret Hospital, which is incorporated in The Ontario Cancer Institute, are financed similarly to those of other public hospitals in Ontario, with the exception that, as a radiotherapeutic centre, additional funds are received from The Ontario Cancer Treatment and Research Foundation.

Basic support for the clinical and fundamental research carried out at The Ontario Cancer Institute is provided by The Ontario Cancer Treatment and Research Foundation and the Province of Ontario. In addition, research grants, contracts, fellowships and scholarships from the following sources have provided the further support necessary for research programs:

Banting Research Foundation
Beecham Inc.
Charlie Conacher Research Fund
Connaught Fund
Crusade Against Leukemia
Cyanamid Canada Inc.
Glaxo Canada
Hoffman La-Roche Ltd.
Hospital for Sick Children Foundation
I.C.I. Pharma
IMREG Inc.
Leukemia Research Fund
McGill University
McNeil Laboratories
Medical Research Council
Miles Laboratories
Multiple Sclerosis Society
National Cancer Institute of Canada
National Cancer Institute, National Institutes of Health (U.S.A.)
Natural Sciences & Engineering Research Council of Canada
Nelson Arthur Hyland Foundation
Ontario Ministry of Health (Provincial Health Research Grants)
Picker Corporation
Pfizer Central Research
Queen's University
Radiological Research Laboratory
Royal College of Physicians
University of Toronto
Warner Lambert Ltd.
World Health Organization

Also, our research and clinical activities are assisted by bequests and donations. In particular we wish to acknowledge the following bequests and donations:

Bequests from the estates of the late:

Jessie H. Brown
Christine L. Christie
Gordon G. Cosens
Catherine J. Cruise
Leon V. Goldberg
Norene C. Hinds
Greta Hutley
Trudy Koritsansky
Peter Maclachlan
Jean McKenzie
Mary E. Patterson
Linda Pyke
Edna M. Seyler
Phyllis M. Smith
Dorothy A. Standing
Claire Stinson

Donations in memory of:

Barrie-Ann Bergsma
Richard Brown
Mary Casson
Charles Caves
Jack Edwards
Donna-Rae Graham
Beatrice Horne
Maurice Jacques
Sara Kirsch
Cheryl Fine Kleinberg
Henry Kwiecien
Debbie Mandel
Helen Markle
Douglas Napier
Joseph Natale
Norma Owen
Cynthia Powers
Richard Remmer
Joseph Rose
Mary Simon
Peter Smith
June Stesco

Substantial donations from:

Mr. & Mrs. M.J. Allen
Aldworth Chapter #29 Order of Eastern Star
Mrs. A. Armstrong
Mr. N. Auslander
Mr. H. Ballard
Mrs. M. Black
Mr. G. Bradner
Brewers Warehousing Welfare Fund
Mrs. J. Brownlee
Mr. & Mrs. E. Burstein
Dr. R.S. Bush
K.G. Campbell Corporation
Dr. J. Carruthers
Dr. S.D. Chris
Mr. & Mrs. H. Curry
Eaton's Shoppers World Staff
Dr. P.J. Fitzpatrick
Mrs. K.V. Foster
Mrs. H. Glick
Globe & Mail Employees Welfare Fund
Go Club Executive, Garrett Mfg. Co. Ltd.
Gordonridge Seniors
Mr. A. Gray
Mrs. M. Harmer
Mr. W.B. Harris
Heaslip Willing Workers
Mr. T. Kelly
Mr. C. Mackenzie King
Mr. J. Kramer
Dr. W. Mahon
Mrs. A. McGovern
Mr. D.W. Menzel
Mrs. F.H. Moir
Mr. R. Moranis
Mr. D. O'Laurie
Our People Fund, Bank of Montreal
Mrs. S. Patel
Mrs. M. Poliacik
Prof. A. Porter
Mrs. F. Rice
Mrs. M. Robertson
Helen McRae Peacock Foundation
Mr. & Mrs. G.E. Rutherford
Co. Harland Sanders Charitable Organization
Ladies Auxiliary, Showmen's League of America
Dr. W.J.K. Simpson
Mr. R.W. Stevens
Mr. S.R. Stevens
Mr. A. Stevenson
Dr. & Mrs. Wm. Taylor
Mr. B. Thomas
Thrush Incorporated
Mrs. Y. Vetere
Miss N. Weir
Mr. K. Wildi
Mr. & Mrs. L.H. Williams

Auditors' Report and Financial Statements

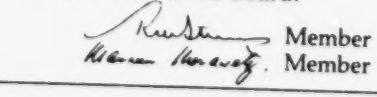
The Ontario Cancer Institute

Balance Sheet

MARCH 31, 1983
(with comparative figures at March 31, 1982)

ASSETS	1983	1982
Integrated Fund		
Current:		
Cash	$ 624,733	
Short-term investments, at cost (which is equivalent to market)	2,564,411	$ 3,910,016
Accounts receivable –		
Patients' accounts	641,065	520,900
Ontario Ministry of Health	1,946,416	1,553,230
The Ontario Cancer Treatment and Research Foundation	422,615	569,173
Research grants	83,396	381,394
Other	793,906	786,856
Due from the endowment and special purposes fund	37,509	
Inventories, at cost	637,774	724,255
Prepaid expenses	110,488	88,448
Total current assets	7,862,313	8,534,272
Property, at cost:		
Land	3,033,365	3,033,365
Building	18,913,045	17,931,010
Equipment and furniture	18,267,770	15,437,591
	40,214,180	36,401,966
Less accumulated depreciation	17,166,610	15,415,630
	23,047,570	20,986,336
Construction in progress	369,160	1,315,746
	23,416,730	22,302,082
	$31,279,043	$30,836,354
Endowment and Special Purposes Fund		
Cash	$ 53,176	$ 41,629
Due from the integrated fund		176,054
Investments, at cost plus accrued interest (market value 1983 – $10,984,542; 1982 – $8,490,675)	10,938,682	9,113,993
	$10,991,858	$ 9,331,676
Total assets	$42,270,901	$40,168,030

On behalf of the Board:



Member

Member

(See accompanying notes)

LIABILITIES AND FUND BALANCES	1983	1982
Integrated Fund		
Current:		
Bank indebtedness		$ 2,533,819
Accounts payable and accrued liabilities	$ 5,684,997	4,617,494
Due to the endowment and special purposes fund		176,054
Total current liabilities	5,684,997	7,327,367
Fund balance	25,594,046	23,508,987
	$31,279,043	$30,836,354
Endowment and Special Purposes Fund		
Due to the integrated fund	$ 37,509	
Fund balance	10,954,349	$ 9,331,676
	$10,991,858	$ 9,331,676
Total liabilities and fund balances	$42,270,901	$40,168,030

Auditors' Report

To the Members of
The Ontario Cancer Institute:

We have examined the balance sheet of The Ontario Cancer Institute as at March 31, 1983 and the statements of operations, fund balance and changes in financial position of the integrated fund and the statement of endowment and special purposes fund for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of the Institute as at March 31, 1983 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Clarkson Gordon

Toronto, Canada,
June 3, 1983.

Chartered Accountants

The Ontario Cancer Institute Financial Statements

Integrated Fund Statement of Operations

FOR THE YEAR ENDED MARCH 31, 1983
(with comparative figures for the year ended March 31, 1982)

	1983	1982
Revenue for patient care, research and education:		
Ontario Ministry of Health and others for patient services	$34,226,426	$28,870,190
The Ontario Cancer Treatment and Research Foundation	4,273,854	3,398,735
Other granting agencies	5,582,035	4,928,906
Sundry	1,709,880	1,008,955
	45,792,195	38,206,786
Expenses for patient care, research and education:		
Salaries and wages	29,890,672	25,420,699
Supplies and other operating expenses	15,030,750	12,623,108
	44,921,422	38,043,807
Excess of revenue over expenses before depreciation	870,773	162,979
Depreciation of buildings	473,267	448,496
Depreciation of equipment and furniture	1,278,988	1,057,798
	1,752,255	1,506,294
Excess of expenses over revenue for the year	$ 881,482	$ 1,343,315

(See accompanying notes)

Integrated Fund Statement of Fund Balance

FOR THE YEAR ENDED MARCH 31, 1983
(with comparative figures for the year ended March 31, 1982)

	1983	1982
Balance, beginning of year	$23,508,987	$21,843,075
Deduct excess of expenses over revenue for the year	881,482	1,343,315
	22,627,505	20,499,760
Add:		
Grants for building alterations and equipment –		
Ontario Ministry of Health	1,270,083	2,414,853
The Ontario Cancer Treatment and Research Foundation	1,428,818	57,180
Transfer from endowment and special purposes fund	110,923	
Other	156,717	537,194
	2,966,541	3,009,227
Balance, end of year	$25,594,046	$23,508,987

(See accompanying notes)

The Ontario Cancer Institute
Financial Statements

Integrated Fund Statement of Changes in Financial Position

FOR THE YEAR ENDED MARCH 31, 1983
(with comparative figures for the year ended March 31, 1982)

	1983	1982
Sources of funds:		
From operations –		
Excess of expenses over revenue for the year	$ (881,482)	$ (1,343,315)
Add depreciation not requiring an outlay of funds in the current year	1,752,255	1,506,294
	870,773	162,979
Grants for building alterations and equipment	2,966,541	3,009,227
Proceeds on disposal of fixed assets	1,570	
Total sources of funds	3,838,884	3,172,206
Application of funds:		
Fixed asset acquisitions	2,868,473	3,018,574
Increase in working capital	970,411	153,632
Working capital, beginning of year	1,206,905	1,053,273
Working capital, end of year	$ 2,177,316	$ 1,206,905
Represented by:		
Current assets	$ 7,862,313	$ 8,534,272
Current liabilities	5,684,997	7,327,367
	$ 2,177,316	$ 1,206,905

(See accompanying notes)

Statement of Endowment and Special Purposes Fund

FOR THE YEAR ENDED MARCH 31, 1983
(with comparative figures for the year ended March 31, 1982)

	1983	1982
Balance, beginning of year	$ 9,331,676	$ 7,209,422
Bequests and donations received	523,147	538,545
Investment income	1,179,215	1,344,540
Net parking and rental income		237,796
Other income	55,802	20,662
Disbursements	(24,568)	(19,289)
Transfer to integrated fund	(110,923)	
	1,622,673	2,122,254
Balance, end of year	$10,954,349	$ 9,331,676

(See accompanying notes)

The Ontario Cancer Institute Financial Statements

Notes to Financial Statements

MARCH 31, 1983

1. Summary of significant accounting policies

(a) Basis of Ministry of Health funding –
Pursuant to the Health Insurance Act the Institute receives funds from the Ministry of Health to substantially cover its operating costs. Funds are received during the year based on a total amount approved by the Ministry prior to the commencement of the fiscal year. Any surplus or deficit arising from the difference between the Institute's actual operating results for the year and the amount approved by the Ministry is retained or financed by the Institute.

Prior to 1983 a final amount to be either recovered or paid by the Institute was determined after the Ministry had reviewed the Institute's actual operating results as shown in the financial and statistical returns for the year. This amount was calculated so that the Institute was reimbursed for the total of its operating costs, after the deduction of specified revenues and expenses.

(b) Depreciation –
Although substantially all fixed assets acquired by the Institute are financed by the Ministry of Health and The Ontario Cancer Treatment and Research Foundation, the cost of such assets is recorded in these financial statements and depreciated on a straight line basis at the following rates:
Buildings - 2 1/2%
Major equipment - 5%, 6.6%, 10% or 20%

(c) Endowment and special purposes fund –
Donations, gifts, and bequests to the Institute are credited directly to the endowment and special purposes fund. In prior years, income from the integrated fund investments, rental properties and from parking lot operations were also credited directly to the endowment and special purposes fund. As a result of the change in the basis of Ministry of Health funding, such income, which in 1983 amounted to $409,534, was credited to the integrated fund.

Disbursements from the fund are made in accordance with the terms associated with the donations, gifts and bequests and for special purposes approved by the members of the Institute.

2. Tax status

The Ontario Cancer Institute is registered as a charitable organization under the Income Tax Act (Canada) and is therefore exempt from income tax and may issue tax deductible receipts to donors.

3. Commitments

The Institute in 1982 entered into an agreement to purchase radiotherapy equipment for an amount of $2,151,000 of which $1,293,559 had been spent to March 31, 1983. The balance will be paid over the next two years.

4. Pension plan

The Institute has a voluntary pension plan for its employees. Based on the most recent actuarial valuation of the plan as at July 1, 1980, there is no unfunded liability.

POOR

QUALITY

ORIGINAL